THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
November 28, 1988 · Vol. XXII · No. 48 · 132 Pages · $2/Copy · $44/Year

COMPUTERWORLD

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Cullinet inching back to the black

BY NELL MARGOLIS
CW STAFF

WESTWOOD, Mass. — At Cullinet Software, Inc., Thanksgiving had a lot more to do with profits than with Pilgrims. The company — whose recent turbulent times are written in red ink on the balance sheets — reported its first quarterly operating profit in two years.

Although the company realized a net loss of $428,000 for the quarter ended Oct. 31 due to losses from discontinued operations, it posted an operating profit from continuing operations of $206,000. In the comparable quarter a year ago, Cullinet absorbed a $5.8 million net loss, and red ink from continuing operations at that time amounted to $9.9 million.

"I think this is the most satisfying moment I've had in the past 20 years," company founder and Chairman John J. Cullinane said. "I couldn't be more pleased."

In addition to halting the two-year downward trend in earnings, Cullinet reported quarterly revenue of $52.5 million, which is up 7% from second-quarter

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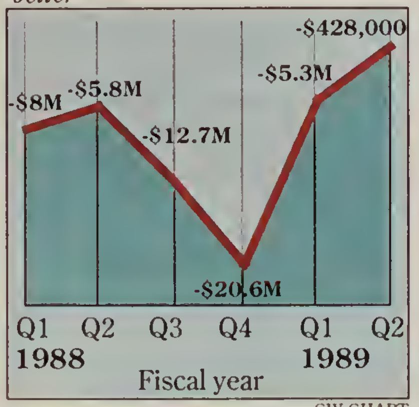
Looking up
Cullinet's latest financial reports indicate a decisive turn for the better



CW CHART

School's out for DP director

BY J. A. SAVAGE
CW STAFF

ARLINGTON, Texas — Ray Harrison knew he was in trouble when he saw the two guards posted outside his Arlington School District office.

They escorted the DP director home; thus began, 2½ years ago, a twisting, turning tale that has made an unassuming computer professional something of a local hero for bringing to light sensational conflict-of-interest charges.

Harrison, who was director of data processing for the 41,000-student district, has filed a $10 million lawsuit against the district for defamation, breach of contract and wrongful discharge. In his complaint, he charges that the guards were posted to keep him from his job until the school board asked for his resignation, which he refused to give. He was then fired.

Harrison claimed his department had received pressure from his boss, District Superintendent Don Wright, to change the district's computers from an

Continued on page 8

IBM gains ground in PC-standard war

ANALYSIS

BY WILLIAM BRANDEL
CW STAFF

Sales of Micro Channel Architecture-based systems are steadily increasing, and although only IBM and Tandy Corp. currently offer MCA systems, the PC vendors supporting an alternative bus technology may discover they are losing the fight in this 32-bit bus market.

The supporters of the proposed Extended Industry Standard Architecture bus specification have claimed that hardware compatibility is the primary reason they announced their alternative to IBM's Micro Channel. They contended that customers are demanding a 32-bit architecture that supports add-in cards used in today's personal computers.

But a new analytical report suggests that the add-in card issue has very little significance. Only 3% of add-in cards are ripped out of older systems and plugged into newer, more powerful systems, according to a study performed by Dataquest, Inc., a San Jose, Calif.-based market research group. IBM commissioned the report.

A spokesman for Compaq Computer Corp. — which, despite claims to the contrary, is perceived as EISA's leader — questioned the report's validity. "Compatibility is certainly an issue," the spokesman said.

Use and abuse

Mike Swavely, Compaq's director of marketing, said IBM is using the report to misstate EISA's argument. Swavely said the main issue revolves around large PC accounts — where, ironically, the Micro Channel is having the most success — that want compatibility between 8-, 16- and 32-bit architectures. "It's not just add-in cards," he said. "It is much more conceptual in nature."

Swavely's comments essentially demonstrate EISA's main problem: No EISA bus or add-in cards are available yet, and they will not be for about a year. Nor does the group have any numbers or market reports that indicate customers are calling for an EISA bus. On the other hand, IBM's steady sales of Micro

Continued on page 121

Kodak develops E-mail for 47,000

BY PATRICIA KEEFE
CW STAFF

ROCHESTER, N.Y. — No one knows better than Eastman Kodak Co. that a picture is worth a thousand words. But when words *are* necessary, some 47,000 employees have found that electronic messaging is the next best thing to being there.

Especially when it is cheaper than conventional messaging systems. The photographic pioneer has managed to provide zap mail at an average cost, in some instances, of 10 cents a shot.

The impact on Kodak has been more far-reaching than one might suppose. "I remember when you had one expensive terminal per work area. We like to say that messaging brought home the need to have a terminal on each desk," said Gerald M. Brown, a senior systems analyst at Kodak's Computing & Telecommunication Services.

Despite having a well-oiled system, Brown and his manager, Lewis Anderson, are the first to admit that Kodak's E-mail empire was not entirely planned. "Really, it's been more a case of [coping with] evolution," said Anderson, who is a supervisor of Kodak's Electronic Mail and Office Systems.

Continued on page 120

Something Blue and something new
Profs and Kodak's internally developed KMX Voice Mail support most users and traffic within the company*

System	Thousands of users	Thousands of messages per day
IBM Profs	45	180
IP Sharp Associates Mailbox	1	1
General Electric Quickcomm	1	0.5
DEC All-In-1	0.5	0.5
KMX Voice Mail	26	75

* Sold to Taigon Corp. Oct. 20, 1988

SOURCE: EASTMAN KODAK CO.
CW CHART

NEWSPAPER

SECOND CLASS MAIL

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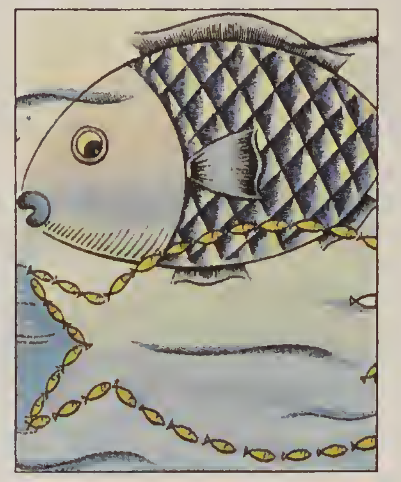

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DAVE FULTON
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Political agenda set

Activists to tackle civil rights, workplace issues

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — In 1992, a presidential candidate might be taunted for being a card-carrying member of Computer Professionals for Social Responsibility (CPSR).

While not as ubiquitous as the American Civil Liberties Union, CPSR will be encountered in an increasing number of areas. In addition to its traditional concerns of arms control and preventing nuclear war, the group will become involved in civil rights and workplace issues — employee monitoring, bridging social and technical solutions at work and bringing blue-collar professions responsibly into a computerized world.

At least, that is the plan revealed last week at CPSR's annual meeting.

One likely area of activism will be to reduce management monitoring of workers via terminals, which some say intrudes on privacy and can negatively affect the quality of work while keeping the appearance of productivity. A more difficult area to grasp and take action on is to keep the social fabric of the workplace from being torn by technical solutions offered by computers.

"It can undermine effectiveness of technical solutions if you ignore their social context," said Robert Howard, senior editor of MIT's *Technical Review* magazine. "It goes to the heart of what kind of economic [culture] we're going to have."

AT&T line safeguards just can't quite cut it

BY JAMES DALY
CW STAFF

SOUTH AMBOY, N.J. — Although a stepped-up plan to reduce accidental cable cuts has been in effect for more than a year, an AT&T spokesman acknowledged that communications interruptions like the one that jarred businesses on the East Coast 10 days ago will never be 100% preventable.

The inadvertent slicing of a voice- and data-carrying fiber-optic cable happened at Conrail's Brown Junction railway yard here Nov. 18 at 12:15 p.m. Eastern Standard Time [CW, Nov. 21] and was fixed by 4 a.m. the following morning, AT&T spokesman Ralph Dobriner said. Contractors installing piping at the site were blamed for cutting the cable, which serves as the main pipeline for AT&T long-distance customers between the Northeast and Southeast.

In an effort to reduce the number of such goofs, the communications giant began emphasizing a public awareness program a year ago that encourages construction workers to think before they dig.

The program even sends out spotter aircraft that patrol the land above buried cables looking for digging that may endanger a communications line.

Still, some problems slip through. "Last year, we experienced 14 light-guide cable cuts, and this year we've had only six," Dobriner said, "but every so often someone doesn't get the message."

Dobriner added that no new plans have been unveiled as a result of the breakdown but expressed hope that the high-profile break may encourage others to contact the communications giant before they dig.

The break sideswiped many businesses in the northern New Jersey, New York and New England area. Following the cut, there was heavy blocking of calls, with callers likely to hear a recording telling them that their calls could not be completed. Dobriner said about 3.5 million calls were affected during the crisis.

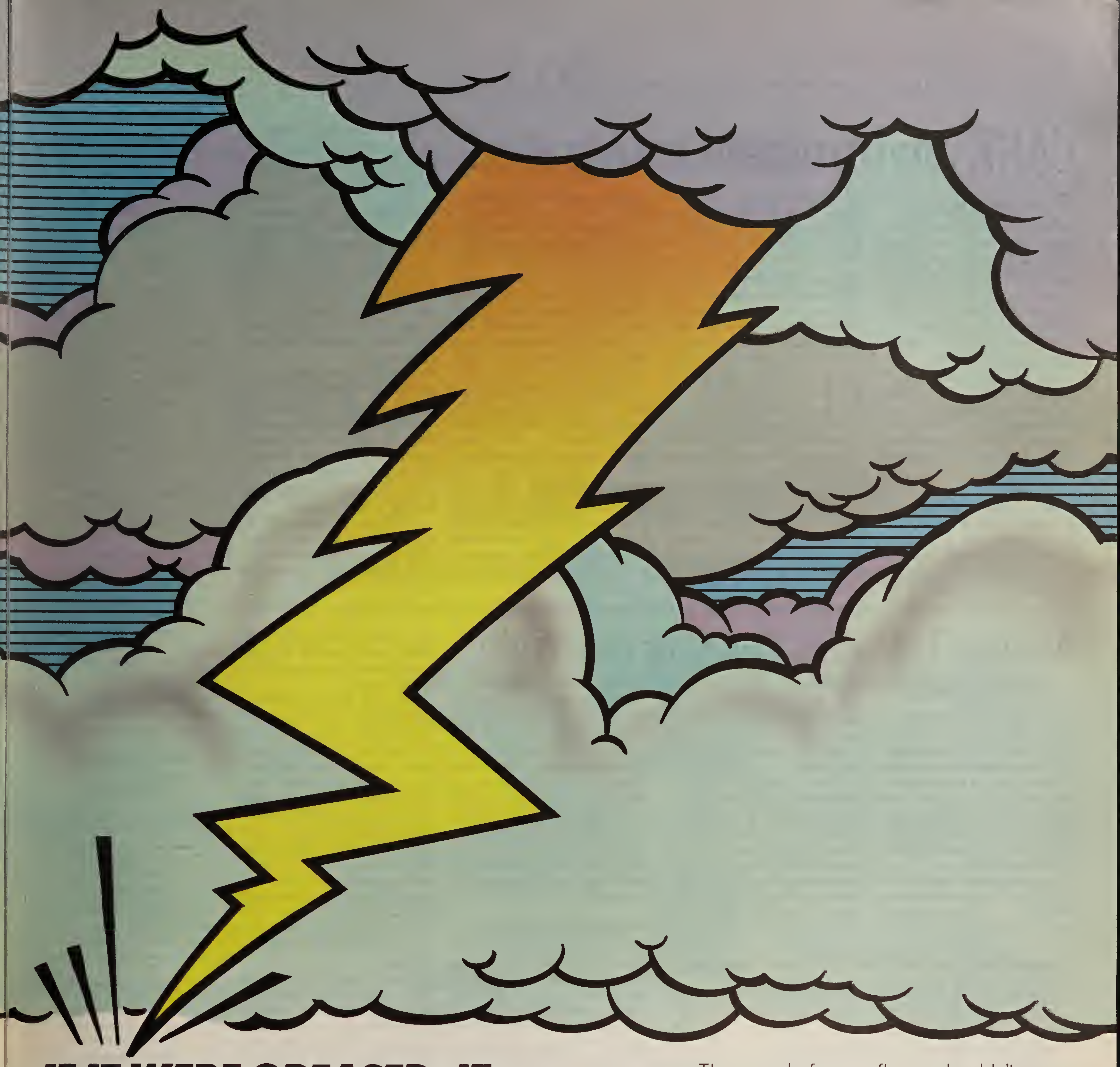
AT&T's dynamic routing feature, however, helped alleviate some of the pressure. "The feature can select from 14 alternate paths to route a call," Dobriner noted.

More seriously affected, however, were data-carrying leased-line connections that run over the fiber-optic cable. Leased-line connections are point-to-point connections that cannot be routed off the cable and needed to be physically reconnected.

CORRECTIONS

The Siemens Information Systems, Inc. 2050 nonimpact printer is an LED array printer [CW, Nov. 7].

A Data View on prices of IBM software that ran in the Systems & Software section [CW, Sept. 26] was based on information supplied in May. The following month, IBM reduced the prices of most of the software packages listed by 5% to 15% [CW, June 13].



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CASE environment integrated

BY ROBERT MORAN
CW STAFF

FORT LEE, N.J. — On-Line Software International, Inc. said last week it is offering IBM DB2 developers an integrated CASE development system with which to keep data specifications consistent throughout a development life cycle.

The company is expected to announce Dec. 6 at CASExpo the knitting together of Casepac, its computer-aided software engineering (CASE) development system, and Intelagen, its menu-based language for generating Cobol and PL/I source code, keeping a promise that it made 15 months ago when it introduced Casepac.

The integrated offering now ranks with the few development environments that span the development life cycle from diagrams to code, said Vaughan Merlyn, chairman of Case Research Corp.

Organized search

DB2 users will need to model, record and verify data, populate the dictionary and write programs against DB2 applications. The new offering will simplify such tasks, Merlyn said, as well as help the organization with the difficult task of tracking them.

The integrated products cost $260,000. Separately, Casepack costs $200,000, and Intelagen costs $60,000.

Casepac, which is integrated with On-Line's DB2 dictionary, fills the gap that IBM left by not supplying its own repository. Casepac's dictionary supports IBM's Data Definition Language, generates tables based on dictionary entries and creates indexes.

It supports DB2 catalogs and DB2's relational applications directory. Further, the firm claimed that developers will only have to define file layouts, table definitions and attributes once, and Casepac will automatically generate all the necessary database definitions for IBM's IMS or DB2.

Casepac's CASE features include the ability to create data-flow diagrams, used for structured analysis, and entity models, used for data modeling.

'Closest to DB2'

Shaku Atre, president of Atre Computer Assistance in Rye, N.Y., said, "Of all the products on the market, Casepac is closest to the DB2 environment in specifications."

No tools available today, including IBM's, satisfy all the requirements for building DB2 applications, Atre added.

Like Pansophic Systems, Inc.'s Telon and Sage Software, Inc.'s Application Productivity System Development Center, On-Line's integrated product bridges the front-end design phase with the mainframe-based code-generation back end.

But it is in the bridging that the company claimed it differentiates itself.

Ronald Voell, Casepac project director at the Fireman's Fund Insurance Co. in San Francisco, said that the bridge between the products will bring the company productivity benefits, diminish the amount of coding that needs to be performed and reduce the number of human errors.

"Without the bridge, Intelagen would not be able to automatically take advantage of information already captured in the dictionary," he said.

Ashton-Tate sues Fox over copyright

BY DOUGLAS BARNEY
CW STAFF

TORRANCE, Calif. — In 1987, Ashton-Tate Corp. unsuccessfully offered millions to buy Fox Software Corp. This year, Ashton-Tate filed suit against the same company, seeking damages that may run into the millions for allegedly infringing on Dbase copyrights.

The suit, filed earlier this month, also breaks new and potentially industry-shaking ground in its attempt to protect Ashton-Tate's Dbase. Programming languages have never been protected by copyright; if they become so, the shift could threaten the open base of all programming.

The suit alleges that Fox lifted the Dbase-compatible programming language and user interface for its Foxbase from Ashton-Tate's Dbase and seeks unspecified damages, along with the removal of the Fox products from the market. Ashton-Tate counsel Stanley Witkow said he does not expect a trial to get under way for about 18 months.

Fox counterpunched with its own allegations of technology-lifting. Fox President Dave Fulton argued that during the acquisition negotiation process, Fox gave Ashton-Tate developers an inside look at Foxbase' source code. Also, he said, in tape-recorded briefings, Fox developers answered Ashton-Tate's questions about Fox's approach to performance and feature implementation.

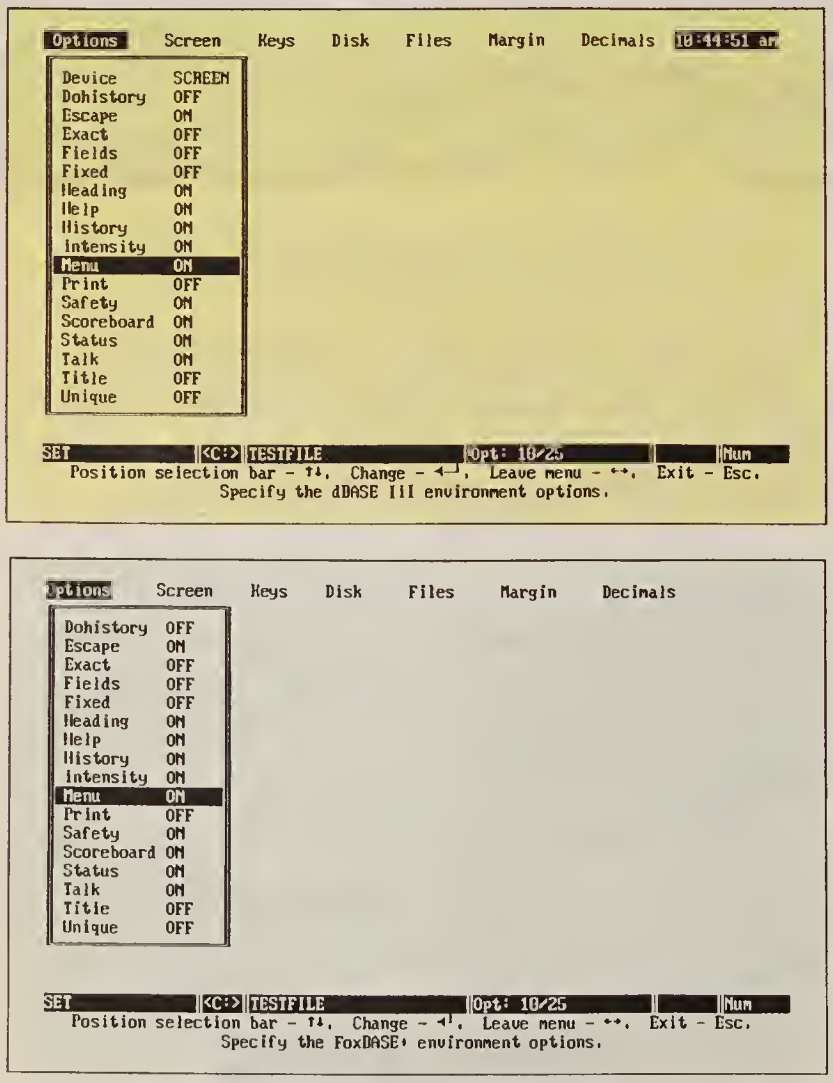
Alleged infringements

Fulton argued that Ashton-Tate took these notions and put them to use in Dbase IV. The implementation of arrays is identical, and the approach to compiling is identical in many respects, Fulton claimed. On a more esoteric level, the parameter-passing and procedure-entering and -exiting are also identical, he said. Finally, Ashton-Tate implemented user-defined functions the way Fox developers had shown them, Fulton said. "We opened our kimonos. We really thought we were going to sell to them," he added, explaining why Fox provided Ashton-Tate with so many product details.

The suit brims with irony. Under the terms of a contract, Ashton-Tate could not sue Dbase cloner Wordtech Systems Corp. after Wordtech sold Ashton-Tate SQL technology. Ashton-Tate also acquired the rights to Frontrunner, a Dbase-compatible memory-resident database management system from Apex Software Corp. that implements a subset of the Dbase language. In fact, the Frontrunner manual clearly states that "Dbase is the model chosen for most of Frontrunner's language features."

Equally ironic is Ashton-Tate's own product strategy, which has borrowed liberally from the work of others. Multimate, the word processing program Ashton-Tate acquired in 1986, was clearly patterned after a Wang Laboratories, Inc. word processor.

Fox claims to have shipped some 100,000 units, but actual licenses may well number in the millions.



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Options     Screen    Keys    Disk    Files    Margin    Decimals   10:44:51 a

  Device      SCREEN
  Dohistory   OFF
  Escape      ON
  Exact       OFF
  Fields      OFF
  Fixed       OFF
  Heading     ON
  Help        ON
  History     ON
  Intensity   ON
  Menu        ON
  Print       OFF
  Safety      ON
  Scoreboard  ON
  Status      ON
  Talk        ON
  Title       OFF
  Unique      OFF

SET           <C:> TESTFILE           Opt: 10/25              Num
  Position selection bar - ↑↓.  Change - ◄┘.  Leave menu - ↔.  Exit - Esc.
               Specify the dBASE III environment options.
```

```
Options     Screen    Keys    Disk    Files    Margin    Decimals

  Dohistory   OFF
  Escape      ON
  Exact       OFF
  Fields      OFF
  Fixed       OFF
  Heading     ON
  Help        ON
  History     ON
  Intensity   ON
  Menu        ON
  Print       OFF
  Safety      ON
  Scoreboard  ON
  Status      ON
  Talk        ON
  Title       OFF
  Unique      OFF

SET           <C:> TESTFILE           Opt: 10/25              Num
  Position selection bar - ↑↓.  Change - ◄┘.  Leave menu - ↔.  Exit - Esc.
               Specify the FoxBASE+ environment options.
```

Ashton-Tate is alleging *that Foxbase (bottom) infringes on copyrights; Fox says the reverse is true of Dbase IV (top)*

Decwindows pep rally

Digital Equipment Corp. is scheduled to hold a panel discussion in New York Wednesday in an attempt to bolster independent software vendor support for its Decwindows program.

The meeting is slated to include the chief executive officers from leading MS-DOS vendors and is intended to demonstrate that key desktop software applications are being ported to DEC's VMS and Ultrix operating systems.

Expected to attend are John Warnock of Adobe Systems, Inc., maker of Display Postscript; Ed Esber of Ashton-Tate Corp.; Charles Wang of Computer Associates International, Inc., which sells various software applications gained through acquisitions; Dave Boucher of Interleaf, Inc., a graphics software vendor; and Jim Manzi of Lotus Development Corp.

A DEC spokeswoman said the companies will port their products through Decwindows/Ultrix, Decwindows/VMS and computer-aided software engineering techniques.

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AS/400 customers see new side of IBM

BY ROSEMARY HAMILTON
CW STAFF

When a small number of System/36 users recently complained about migration problems with the low-end Application System/400, IBM set up a special hot line just for them and offered to loan them an additional 4M bytes of memory free of charge for 12 months to ease performance problems.

This is not the usual IBM, but it is very typical of the way the company has handled its AS/400 customers, observers said last week. The reason, observers added, is that IBM very, very badly wants the AS/400 to succeed.

"The AS/400 is their last shot at the mid-range," said Ernest Pyle, vice-president of Mini Development Corp., which provides customized software for the System/36 and AS/400 platforms. "If they don't capture the mid-range market [with the AS/400], they could be out of it. So they're taking their best shot."

Marked improvement

Pyle and users report that IBM's response to AS/400 accounts is excellent and, in some cases, shows a marked improvement over past IBM practices. Users said IBM will do what it takes to prevent bad news that dissatisfied customers can bring.

At First Financial Insurance Co. in Burlington, N.C., an AS/400 delivery was held up for weeks because of a glitch in IBM's order process, according to Gerald Christensen, vice-president of systems administration.

To make amends, "they came out and installed it for us" when the shipment error was corrected, Christensen said.

In the case of the low-end AS/400 performance problems, IBM reacted swiftly and, according to several observers, provided a remedy that went beyond expectations.

"That 4M-byte loaner is above and beyond the call of duty," said John Logan, president of the Aberdeen Group, a market research firm in Boston. "They want this thing to succeed. It's the lifeblood of their Application System strategy, and they have one machine to make it work."

According to users contacted last week, the low-end AS/400s, including the B10 and B20, show big drops in performance when running in System/36 mode with 4M bytes of main memory.

"They are under-horsepowered in System/36 mode," said Pyle, who has been working with a B20. "It was taking 10 to 18 seconds for a change of menu screen."

"My feeling is they have been very responsive, instead of this 'You really don't have a problem, Mr. Customer; it's in your mind' attitude," Pyle added.

When IBM was alerted to the problem through its Customer Advisory Council, which it maintains for its AS/400 business, it offered customers the 4M-byte loaner as well as the hot line and on-site fine-tuning of software programs.

Customers said IBM has also provided temporary program fixes that were designed to address the performance problem. Several of these will be incorporated into the new release of the OS/400 operating system, which was scheduled for shipment last Friday.

When the AS/400 was announced earlier this year, IBM said that users could expect a performance degradation when running programs in System/36 mode on the new mid-range.

But IBM recently opted to provide further assistance to help customers who have not yet fine-tuned their code, the IBM spokesman said.

Dough with the flow

One user said that while he is pleased with IBM's response, he should not have to pay for the additional 4M bytes once the 12 months of free time is over.

"The extra memory should be included anyway if it's the only way for [the system] to run efficiently," said Dick Kuss, data processing manager at Acrowood Corp. in Everett, Wash. "I don't feel comfortable paying for it if 8M bytes should be the starting point."

An IBM spokesman said the company expected such a reaction from some users and considered providing the additional 4M bytes free of charge and establishing 8M bytes as the system's minimum configuration. But IBM decided to fine-tune both applications and the operating system enough so that users can return to the 4M-byte configuration.

Other users reported that IBM has worked closely with them in solving migration problems.

"You give up a lot to run in System/36 mode," said Dennis Klinger, vice-president of MIS at Ryder Truck Rental, Inc. in Miami. "It's a clear and noticeable degradation. But they are really helping me, and they don't always do that."

Ron Cipolla, director of MIS at the Kendall Co. in Boston, said IBM told his staff that its plans to migrate Mapics I, IBM's manufacturing software, to the new platform would not work.

"With IBM, we're now looking at the possibilities of porting it," Cipolla said. It will require a significant rewrite, he added.

IAM vs VSAM
The Incredible Shrinking Machine
IAM Reduces the Size of Your VSAM Files by 30 to 70%

IAM FILE STRUCTURE
IAM SAVES 20 to 40% DASD SPACE

IAM uses an advanced file structure which is far superior to VSAM. IAM's supercompressed index requires a fraction of the space taken by VSAM. IAM's freespace concepts make much more efficient use of disk space. IAM's blocksizes are not restricted as VSAM's are, making full utilization of each track. IAM is not affected by large key sizes which can result in VSAM wasting CI's in every Control Area.

DATA COMPRESSION
SAVES AN ADDITIONAL 20 to 50% DASD SPACE

IAM optionally compresses data records. Most files contain records with unused fields or repeating sets of characters. When IAM applies its proprietary compression techniques, the result is an additional 20 to 50% reduction in file size.

IAM's CPU time is dramatically less than competing compression products. In fact, since IAM's CPU time is normally much less than VSAM, IAM with data compression takes less CPU time than normal VSAM processing.

RELEASE
AUTOMATIC RELEASE OF UNUSED SPACE

IAM takes the guessing game out of VSAM space allocation. Large amounts of disk space are wasted when users over-estimate how much space VSAM requires or how many records a file will contain. VSAM cannot release overallocated space.

TRANSPARENT

VSAM files account for the lion's share of disk space used in most installations. Online systems (CICS), BATCH jobs, TSO, SMP/E and other applications make extensive use of keyed index VSAM (KSDS) files.

IAM is a transparent alternative to VSAM KSDS files, which substantially reduces the impact of VSAM processing in your installation. There are no modifications to programs or JCL to use IAM files in place of VSAM.

SMF ANALYSIS

VSAM SIZE REPORT

DATA SET NAME	ALLOC TRKS	TOTAL EXCPS
BIG.CLUSTER	37155	2507803
BIG.CLUSTER.DATA	37100	2105001
BIG.CLUSTER.INDEX	55	402802
A.FILE.SMALLER	16540	679216
A.FILE.SMALLER.DATA	16500	270501
A.FILE.SMALLER.INDEX	40	408715
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Chip firms see no repeat of '85 fiasco

BY CLINTON WILDER
CW STAFF

Shortly after the inauguration of a Republican president in 1985, the U.S. semiconductor industry headed into the worst downturn in its history. A GOP standard-bearer will once again take the oath of office in 1989, but industry observers believe the industry's deja vu should end there.

Despite the slowing of demand reported recently by Intel Corp. and other firms, analysts say the industry will avoid the disaster of 1985 and 1986. The growth in overall demand will slow down, but semiconductor makers, having learned the hard way about ambitious growth plans and overcapacity four years ago, are in a much stronger position to pick up the slack.

"We think a major slump is very unlikely," said Rajiv Chaudri, a semiconductor industry analyst at Goldman Sachs & Co. "The reasons [for the previous downturn] just aren't there. In this cycle, the crest hasn't been as high as 1984, and the trough will be shallower as well."

Wall Street's institutional investors, however, remain jittery. Last Monday, Intel shares plunged 14% in the over-the-counter market's heaviest volume of the year after the Santa Clara, Calif., chip vendor had slashed its fourth-quarter earnings estimates the previous Friday. The stocks of fellow chip makers Micron Technology, Inc., LSI Logic Corp. and Texas Instruments, Inc. also dropped.

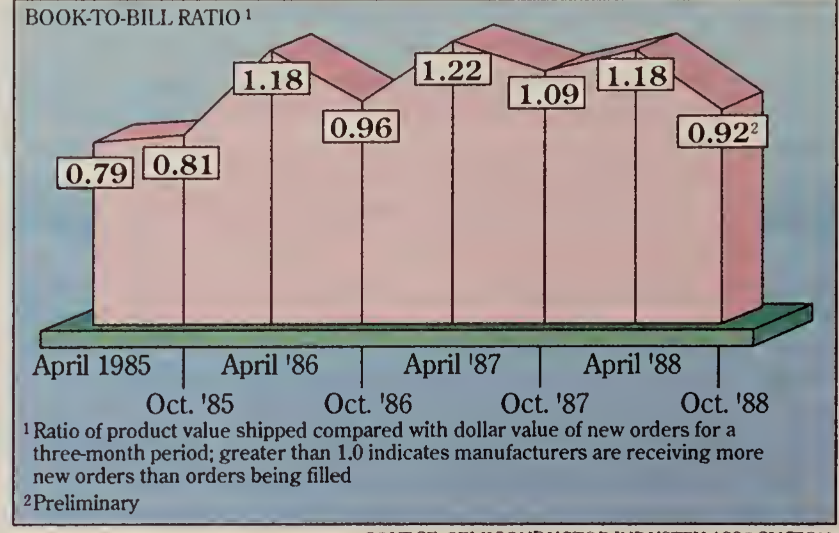
Playing it safe

But those who follow the industry closely see other factors behind the investor panic. "In this stock market, no company can afford to be wrong," Chaudri said. "Some of it is tax-loss selling — people have lost money in technology stocks this year and are bailing out, but they may buy back early next year. The fourth quarter is a pause in growth for these companies, but the full-year comparisons still look good."

Analysts and the Semiconductor Industry Association are forecasting 10% to 15% growth rates for the U.S. industry in 1989 — which is well below 1988's 33% rate but considerably better than the 30% drop suffered in 1985.

There they go again?

After seeing new orders exceed completed orders for more than a year, semiconductor manufacturers in the U.S., Europe and Japan are experiencing a market downturn



[1] Ratio of product value shipped compared with dollar value of new orders for a three-month period; greater than 1.0 indicates manufacturers are receiving more new orders than orders being filled

[2] Preliminary

SOURCE: SEMICONDUCTOR INDUSTRY ASSOCIATION
CW CHART

Among the factors that should prevent a decimating slump in 1989 is the U.S. exodus from the dynamic random-access memory (DRAM) industry. More than any other single factor, the plunge in DRAM prices caused the 1985 debacle. Today, Micron Technology is the only U.S. firm with high DRAM exposure. TI also makes DRAMs, but they account for a small percentage of its business.

The former U.S. DRAM vendors "learned not to do battle with the Japanese in their strong suit," said Steve Szirom, president of HTE Research, Inc., a semiconductor market research firm in Santa Cruz, Calif. Even during the recent DRAM shortage that caused prices to soar, "the major companies did not come back to the business when short-term strategy would have dictated that they should," Szirom said.

Another mitigating factor is much less inventory buildup by semiconductor users than four years ago. The practice of double-ordering and double-booking swelled the semiconductor industry's book-to-bill ratio to a peak of 1.6-to-1 in early 1984, meaning chip makers were booking $1.60 in new orders for every $1 in billings from the previous three-month period.

In the growth year of 1988, by contrast, the ratio — now in decline (see chart) — peaked at about 1.2-to-1. Thus, chip users will not take as long to use up inventories in 1989 as they did in 1985. Users' backlogs are now running at about two months, compared with six months in 1985, said Pat Cox, an analyst at Dataquest, Inc. in San Jose, Calif.

Although Intel blamed inventory buildup of its 80386 microprocessor for its lower earnings forecast, analysts said that situation, because of Intel's role as the sole 386 supplier, is unique to Intel.

Even keel

Intel notwithstanding, the overall industry has less production overcapacity than four years ago. Chaudri estimated that U.S. chip vendors have spent 33% less on additional capacity in the current "up" cycle than they did four years ago.

Analysts also point to the higher-powered personal computers and workstations that fuel demand for the more sophisticated, noncommodity chips in which U.S. makers can still hold their own with the Japanese. "We will move toward perhaps 30 or 40 desktop computing architectures in the 1990s, compared with very few today," Szirom said. "DRAMs, static RAMs and application-specific memories will grow more and more customized, playing into the hands of the U.S. niche players."

In addition, a weaker dollar than in 1985 should aid U.S. firms' competitiveness with the Pacific Rim vendors.

TI sues Micron

Texas Instruments, citing the failure of licensing negotiations, last week filed suit against DRAM maker Micron Technology, claiming Micron's DRAM chips infringe on TI's patents.

In a prepared statement, TI general counsel Richard J. Agnich said that his organization has been in "detailed discussions" with Micron for six months but that the firms were unable to come to terms.

"This has left us with no recourse except litigation," Agnich said.

In 1986, TI filed a similar suit against eight Japanese DRAM firms and one South Korean DRAM maker. TI eventually reached licensing pacts with all nine companies, and the litigation ended. TI and Micron are the only two remaining U.S. producers of DRAMs.

CLINTON WILDER

HP ties its 3000 to hot LANs

BY ELISABETH HORWITT
CW STAFF

PALO ALTO, Calif. — Hoping to extend its reach into PC LAN installations, Hewlett-Packard Co. last week announced a program to link its HP 3000 hosts to dominant LAN products.

Initial releases of the HP Network Services LAN Gateway series, due out in the first half of next year, will provide access to HP 3000 files and applications for users of Novell, Inc.'s Netware and 3Com Corp.'s 3+Open, HP said.

"We're extending our PC-to-minicomputer access and resource-sharing capabilities into [PC LAN] environments," said Duncan Campbell, a marketing manager at HP's Colorado Networks Division.

HP's move "essentially acknowledges reality," said David Terrie, president of Newport Consulting in Boston. The company still has a major stake in its own network products, Terrie said.

In particular, a Unix version of LAN Manager that HP is co-developing with Microsoft Corp. would allow HP Spectrum hosts to act directly as servers on personal computer local-area networks without the need of a gateway. "But that big base of Novell and 3Com systems out there won't go away; why lock yourself out?" Terrie said.

The gateway program could potentially position HP minicomputers as connection points between LANs and wide-area networks "tying together a lot of distributed networks out there that happen to be 3Com or Novell," he added.

Makes PC a gateway

The software converts a networked IBM Personal Computer into a gateway that allows other PCs on the LAN to access HP 3000 applications as terminals or to download files for local processing, Campbell said. PCs can also share printers, plotters and files on the host.

It runs on IBM PC ATs or compatibles, HP Vectras and Compaq Computer Corp. micros and supports up to 30 users. The 3Com and Novell gateways will run on HP's Starlan 10, 802.3 Ethernet on thin or thick coaxial cable or token-ring networks, Campbell said. The gateway is priced at $4,995.

HP also announced that it has certified Netware and 3+Open to run on Starlan 10, a 10M bit/sec. network that runs over twisted-pair wiring.

Cullinet's

FROM PAGE 1

revenue in fiscal 1988.

Both revenue and earnings "are a little better than I expected," said Rick Sherlund, an analyst at Goldman Sachs & Co. "I think things have bottomed out at Cullinet. The question in my mind is, Where do we go from here?"

Forward, according to Cullinane: "Hold the line on expenses and increase revenues — that's the game plan."

Cullinane credited much of the second quarter's show of strength to the market's embrace of new Cullinet products, pointing specifically to two major sales of the recently unveiled banking software package and AT&T's decision last month to standardize on Cullinet's Enterprise Computing line of applications development and networking software.

Paine Webber, Inc. analyst Robert Therrien said he also saw a thumbs-up signal in sales of the Enterprise Computing products. "Just look at the AT&T deal — if you don't think that's big, think again," he said.

While Cullinet declined to specify the dollar figures of any individual sale, Therrien noted that "just the endorsement of Cullinet by a company the size of AT&T would be significant." It becomes more so, however, "when you stop to think that Cullinet just got into Unix, and AT&T is the father of Unix."

Too early to tell

Goldman Sachs' Sherlund agreed that Cullinet's Unix development effort is encouraging. However, he considered it too early to say just how much off a comeback the company has made and how long it will last.

Sherlund projected a modest net profit for Cullinet's third quarter, "and the April quarter traditionally is a strong one for them." However, he said, "They could lose money again in July."

Longer term? "That's a tough call," Sherlund said. "Cullinet's applications are all built on top of their database. The mainframe database market isn't growing; the application development business is."

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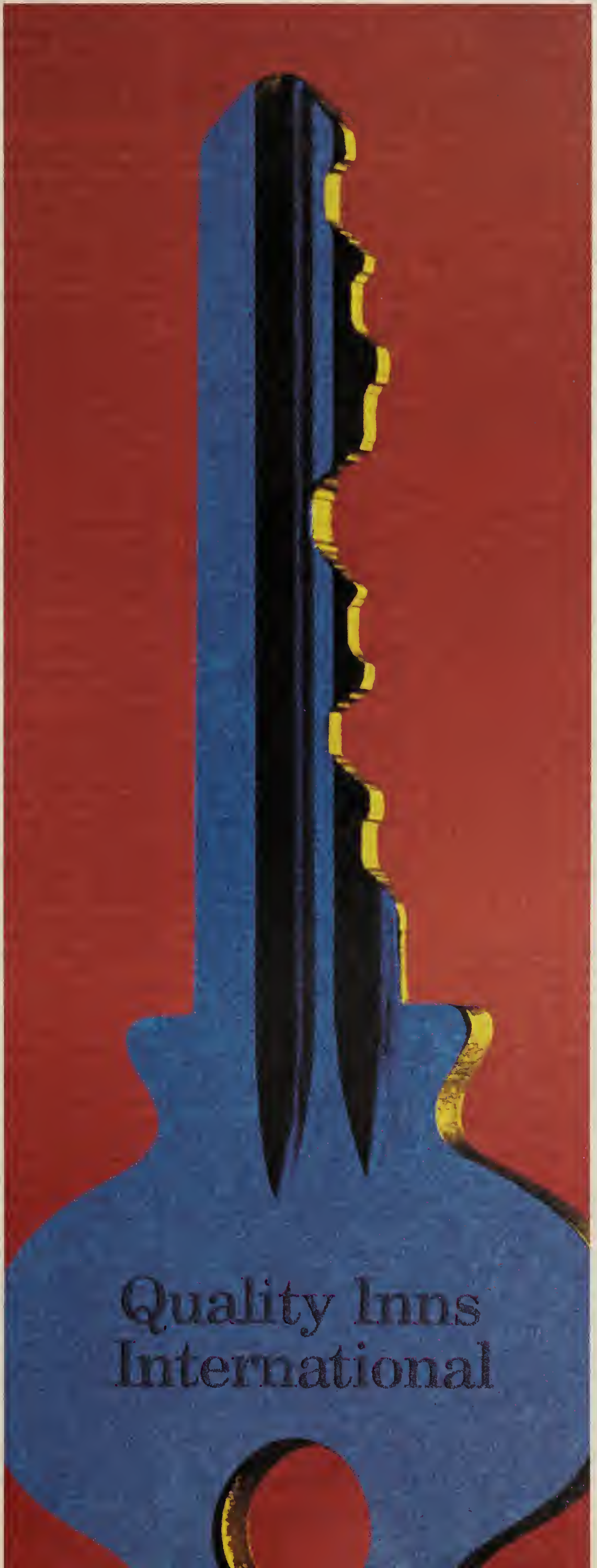

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NEWS SHORTS

WCC nixed after one year

The Interface Group, Inc. has sounded its version of a death knell for general-purpose computer shows by quietly confirming the demise of the World Congress on Computing (WCC). The first and last WCC meeting was held in Chicago in March, a hopeful start-up on the heels of the National Computer Conference's departure last year. Interface ran the show in conjunction with its Interface '88 communications conference. Spokesmen blamed WCC's death on attendee interest in vendor-, industry- and application-specific conferences. Sponsors said the Interface show, now known as Interface Plus, will address the needs of MIS managers as well as communications specialists in the future.

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DOS, MVS conversions down

According to a recent issue of "The Focus Report" newsletter, operating system conversions have declined from 1987 rates in IBM DOS and MVS/SP sites. According to the study, conducted by Focus Research Systems, Inc. in West Hartford, Conn., fewer than 10% of all DOS sites polled said they plan an operating system upgrade or conversion by year's end. That figure is down from 13% in 1986 and 12.3% in 1987. Additionally, MVS/SP sites that said they would convert to MVS/XA have dropped to 23.9% this year, following last year's 35.2% rate.

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Chen-IBM supercomputer details

IBM lifted a corner of the veil of secrecy surrounding its collaboration with supercomputer designer Steve Chen recently. Senior Vice-President Carl J. Conti, speaking at Supercomputing '88 in Kissimmee, Fla., said the new supercomputer will have as many as 64 parallel processors and 100 times the power of today's most powerful super. Chen led the design of one line of Cray Research, Inc. supercomputers before leaving to start his own company.

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Emulex rejects takeover bid

Emulex Corp., a Costa Mesa, Calif., maker of storage and communications peripherals — primarily for Digital Equipment Corp. minicomputers — said it rejected an unsolicited takeover proposal by a Boston venture capital firm, TA Associates. The firm proposed to buy Emulex in a cash offer of $11.50 per share; the stock has traded in the past 12 months for between $4.13 and $11.13 per share. "Emulex is not for sale," said Fred B. Cox, chairman, in a prepared statement.

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Proteon says bug fixed

A design glitch in one of Proteon, Inc.'s 4M bit/sec. token-ring hubs — the Model 2710 — that had been stopping some networks cold has been fixed. The Westboro, Mass.-based network vendor said customers can swap their old units for new ones at no charge once Proteon verifies that they have the problem. The glitch has been traced to configurations featuring a combination of some brands of IBM Personal Computer clones, IBM Token-Ring adapters and Proteon's hub. During power-up, the power relay sometimes fails to latch, or join, the ring. So Proteon revamped the design. About 50 sites experienced the problem.

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Hitachi likely NAS bidder

While National Semiconductor Corp. still refuses to confirm that its mainframe computer company, National Advanced Systems (NAS), is up for sale, a Japanese newspaper, *Nikki,* reported that NAS is not only up for sale but also that its Japanese supplier, Hitachi Ltd., is a likely bidder. While James Barlage, an analyst at New York's Smith Barney, Harris Upham & Co. said he is surprised at the Hitachi report, he added that he believes NAS is up for sale. "Hitachi would be the buyer of last resort. It's conceivable that may be the case," he said. Barlage said that such a move, however, would go against Hitachi's long-term strategy of bringing its proprietary machines into the U.S. market, leaving IBM plug-compatibility to a U.S.-based company.

Study: Spending up; stress on strategy

BY JAMES CONNOLLY
CW STAFF

CAMBRIDGE, Mass. — Information systems spending will rise by an average of 7.5% at large U.S. companies in 1989, in an era when the importance of strategic systems is growing, according to a study by the management consulting firm Index Group, Inc.

Index principal Charles Callan theorized that most of the increases related to creeping nondiscretionary expenses such as maintenance and enhancements.

When asked to rate critical IS issues, the leading point listed by managers was use of IS for competitive advantage, which had been ranked fourth in a similar survey in 1987. The challenge of "aligning IS and corporate goals" dropped from first to second in the surveys.

Callan said he was surprised to see the strong interest in strategic systems. "My feeling was that the bubble burst on that a few years ago," he said, although he noted that the concept of strategic systems may be shifting from massive projects to smaller marketing-related systems that are difficult to cost-justify.

Unexpected results

He said 7.8% budget growth at a time when only 10% of the respondents said they can measure the value of systems is phenomenal. "The positive side to that may be that people continue to invest in systems although the ability to measure value is getting fuzzier," he said.

Index officials said issues that ranked surprisingly low in importance were cost-cutting (14th) and determining appropriate funding levels (19th) and the value of applications (20th).

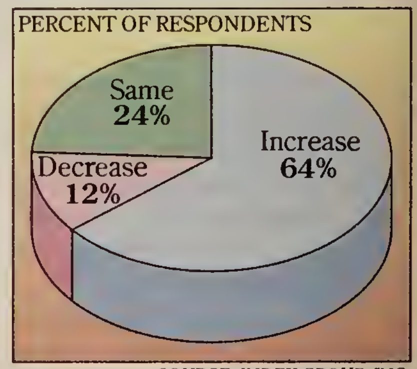
While 58% of the IS executives said the chief executive officer's perspective on information technology is the key factor in determining its effective use, almost three-quarters said line managers and functional managers are increasingly making such decisions — frequently with a negative result.

"The results — particularly about the increasing involvement of line and functional managers with information technology — put a new light on the push for partnership relations between IS and business managers. To me, it says that user involvement in information technology is positive when the users know what they are doing," said Index Senior Vice-President Cyrus F. Gibson.

More than half the IS executives said the skill most lacking on their IS staffs is understanding their companies' business, and most (78%) said they need better links between IS planning and business planning.

Get out the checkbooks

Survey of 240 information systems executives indicates large majority expects increased budgets next year



SOURCE: INDEX GROUP, INC.
CW CHART

School's out

FROM PAGE 1

IBM 4361 mainframe to an IBM System/38 minicomputer. This plan, Harrison alleged, also included buying software from a company in which a friend of Wright's has a financial stake.

Now, the Texas attorney general is investigating the possibility of antitrust law violations; the Texas Education Agency is looking into improper bidding; and the Federal Bureau of Investigation, while not confirming an investigation, is reported to have requested the *Dallas Morning News'* computer printouts of all stories regarding the case.

Wright resigned in September after admitting he took one trip to Europe and Asia and another to West Germany, primarily at a software company's expense, in exchange for consulting work. The company, Prescription Learning Corp. in Phoenix, provided learning programs for the district's Tandy Corp. microcomputers. The district approved a $200,000 contract with Prescription Learning before Wright divulged his involvement.

Stephen Lee, legal counsel for Prescription Learning, said that company's president paid for the Asia trip, not the firm itself.

The attorney for Wright and the school district would not comment on the case other than to say, "We don't agree with much of anything that [Harrison] says after his name and address."

According to memorandums filed in the case, Wright claimed the System/38 would take fewer people to run and would save the district $180,000 per year.

The district bought a System/38 Model 700 in May 1987 and added an IBM Application System/400 Model 60 this past September, said Rod Watkins, the district's current director of data processing. The DP staff has not been cut, he added.

His own programs

Harrison said he had developed nearly $1 million worth of software programs in-house for the 4381. He said he had told Wright it was not economically feasible to throw those programs out in favor of a different architecture requiring new software.

Harrison said he was planning to upgrade the mainframe but was interested in a non-IBM system. "On the day they escorted me out, I was to get a quote on a new system from Amdahl," he said. In a memo charging Harrison with being "guilty of poor management . . . and insubordination," Wright noted that a man named Al Shockley at the Dallas Computer Mart suggested that the district go with a System/36 or 38.

Shockley, who has been described by Harrison and in published reports as a friend of Wright and was a former employee of Wright's in another school district, is the marketing manager at Salt Lake City-based J&K Computer Systems, Inc., which now supplies software packages for the district's new System/38. According to Joe Mildenhall, vice-president of systems at J&K, Shockley has some financial interest in the company but "is not a principal."

J&K and Prescription Learning denied any wrongdoing. J&K's Mildenhall said that while his firm's software is usually licensed through IBM, this software was directly licensed to the school district.

While backroom pressures are certainly not uncommon in any business, Harrison's suit brought computer acquisition ethics into the daily lives of concerned citizens in the school district. When more than 100 people attended a board meeting expecting to hear a discussion of Harrison's suit and Wright's extracurricular activities, the board had no public discussion, angering locals to the extent that they organized a "shadow" school board to keep track of its actions.

"The people of Arlington were disturbed; no one was happy except for the superintendent, who received about $100,000 when he resigned. The board didn't have to do that," former shadow school district president Robert Romack said. School board members would not comment on the case, which is set for trial next March.

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Downsizing threatens MIS influence

BY MICHAEL ALEXANDER
CW STAFF

An MIS manager, who asked not to be named, said he saved his company $100,000 a year by scrapping an Atex, Inc. publishing system and replacing it with a local-area network of IBM PC ATs and Apple Macintoshes. But instead of getting a bonus, he was transferred to a less desirable job within the company.

Is this the sort of thanks that other MIS managers will receive for downsizing?

Moving applications from mainframes and minicomputers on to micros, called downsizing, is becoming as popular in corporate America as leveraged buyouts. But there is a potential downside to downsizing that many MIS managers may not have considered.

Like leaves in the wind

As a result of this trend, the influence of MIS, if not the data center itself, will disperse as rapidly and as widely as the computer systems that MIS has been charged with decentralizing, according to Theodore Klein, president and founder of Boston Systems Group, a consulting firm headquartered in Boston.

"Senior managers often start looking at downsizing as a way to cut bloated bureaucracies, which are often in MIS departments," Klein said. "In other cases, it starts growing out of end-user or departmental expertise. End users begin rebelling against paying exhorbitant mainframe charges, and there is a bottom-up swell that leads to change."

Top management will need to cope with such issues as deciding whether the company's MIS professionals will report to a chief information officer or the heads of departments in which the networks are located, Klein added.

"For somebody who has spent 30 years in the big-iron side of the business, I must admit that the consequences of downsizing to PC networks are scary to contemplate," said Jim Moore, director of information services at Joseph A. Bank Clothiers in Baltimore.

The company has three divisions, consisting of retailing, catalog sales and clothes manufacturing. "We're wrestling with deciding to go with an IBM AS/400 or to a local-area network in each division and whether that will cause us to restructure the data center," Moore said.

The added challenge is configuring either minis or personal computer networks to communicate with each other and with the company's IBM 3083, Moore said.

But he said he does not envision that opting for PC networks instead of minis will lead to downsizing the data center: "In fact, I expect that we will continue to grow, though downsizing might constrain that growth."

Suffer the small

The effect of downsizing is more apt to be felt in smaller data centers that are struggling to grow, agreed Howard Camper, director of the data center at Ashland Oil, Inc. in Lexington, Ky. "They just won't grow as much or as fast as they might have expected," he said. Camper added that he does not expect downsizing to have a significant impact on larger, more established operations like Ashland's.

There is certainly a relationship between downsizing systems and downsizing the data center, but the issue may be more of finding a balance between dispersing the technology throughout the organization and keeping the data center.

One of the key roles of the data center, once downsizing is under way, is to build the architecture on which these dispersed systems will sit. MIS will also be charged with controlling and managing the connectivity of the company's networks and setting guidelines and a methodology for using the network.

"We have put in lots of micros and networked systems, but that hasn't lessened the need for larger systems," said Greg Chetel, director of systems planning and research at Gillette Co. in Boston. "Our corporate MIS-level head count for the last few years has not changed significantly" because of downsizing.

PC octane

The ubiquitous PC — with its price/performance ratio that gets better by the nanosecond — is fueling the push to downsizing. Some analysts predict that by the mid-1990s, as much as 80% of corporate computing power will be on networks of PCs and that many of those micros will have the computing muscle of 10 million instructions per second or more, rivaling today's mainframes.

PC networks are already reshaping the minicomputer industry, according to The Sierra Group, Inc., a market research firm based in Tempe, Ariz. A recent survey conducted by the firm of more than 2,000 companies found that 30% are using PC networking technologies, up from 24% in 1987.

Based on current growth rates, by 1992, LAN-based solutions could easily overtake centralized departmental minis. By 1995, networked topologies will represent the larger share of installations, The Sierra Group predicted.

Arizona . Soldiers in kitchen car, being taken to desert training camps. (Credit: Bettmann)

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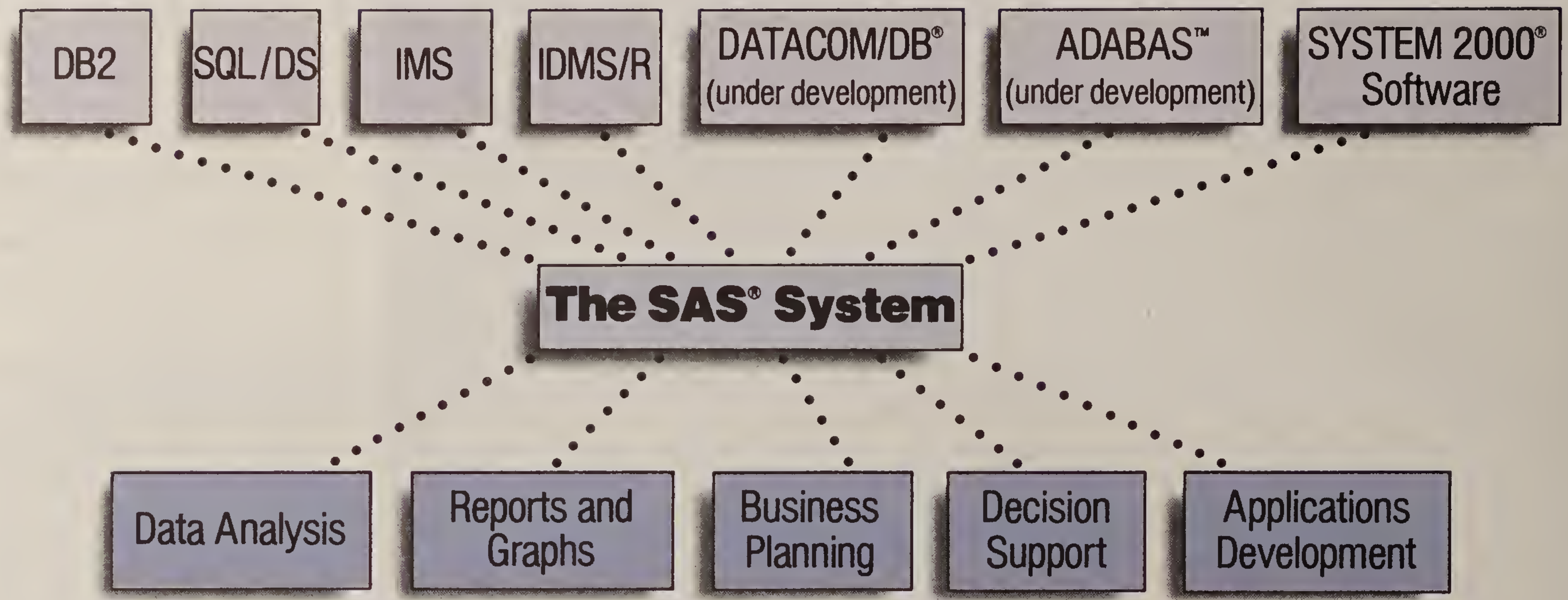

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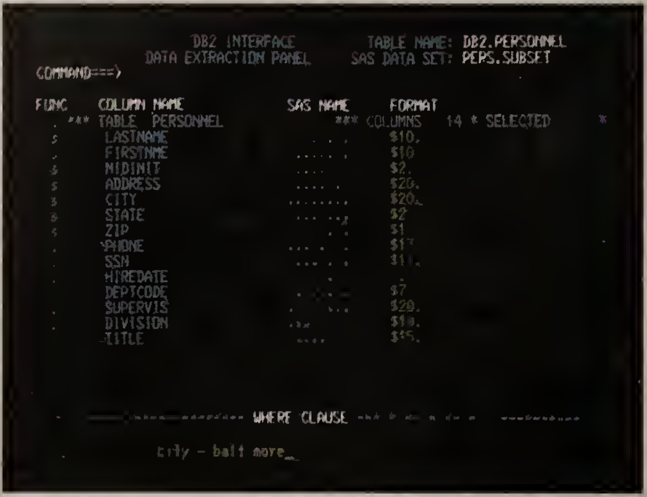

```
                    DB2 INTERFACE          TABLE NAME: DB2.PERSONNEL
             DATA EXTRACTION PANEL      SAS DATA SET: PEPS.SUBSET
COMMAND===>

FUNC    COLUMN NAME              SAS NAME     FORMAT
    *** TABLE  PERSONNEL              *** COLUMNS   14 * SELECTED
          LASTNAME                          $10.
          FIRSTNME                          $10
          MIDINIT                           $2.
          ADDRESS                           $20.
          CITY                              $20.
          STATE                             $2
          ZIP                               $1
          PHONE
          SSN
          HIREDATE
          DEPTCODE                          $7
          SUPERVIS                          $20.
          DIVISION                          $10.
          TITLE                             $15.

                         WHERE CLAUSE

              city - baltimore_
```

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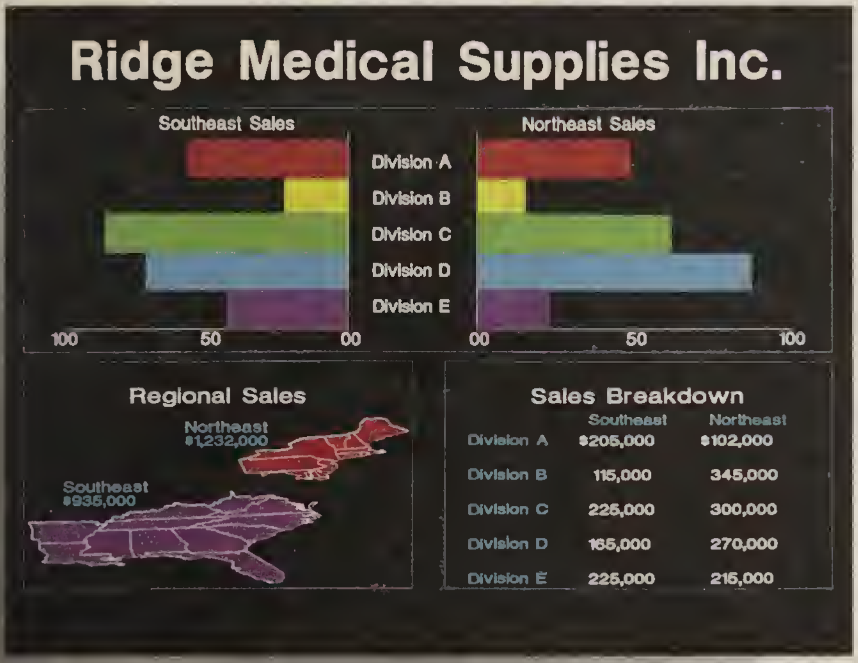
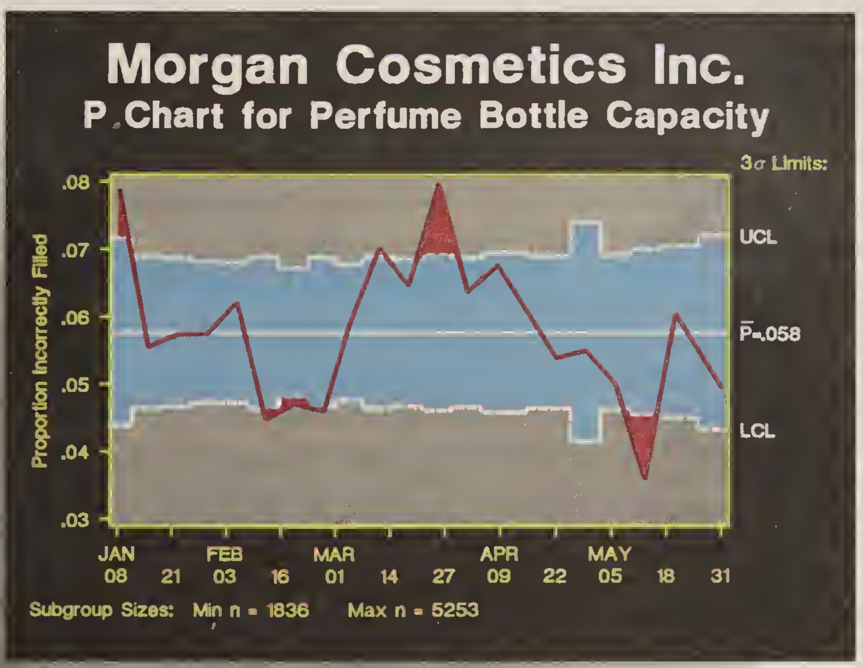
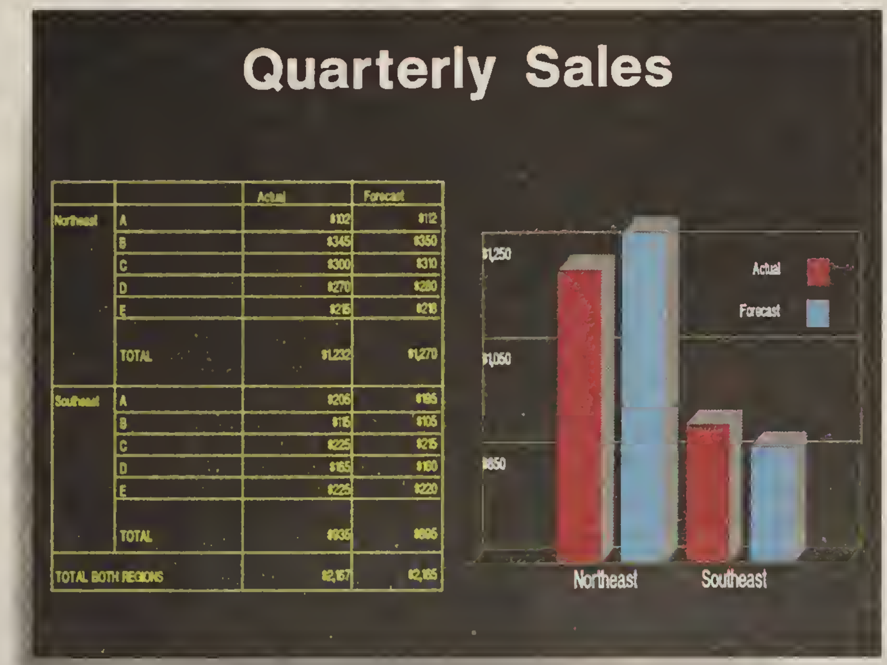

Ridge Medical Supplies Inc.

Sales Breakdown

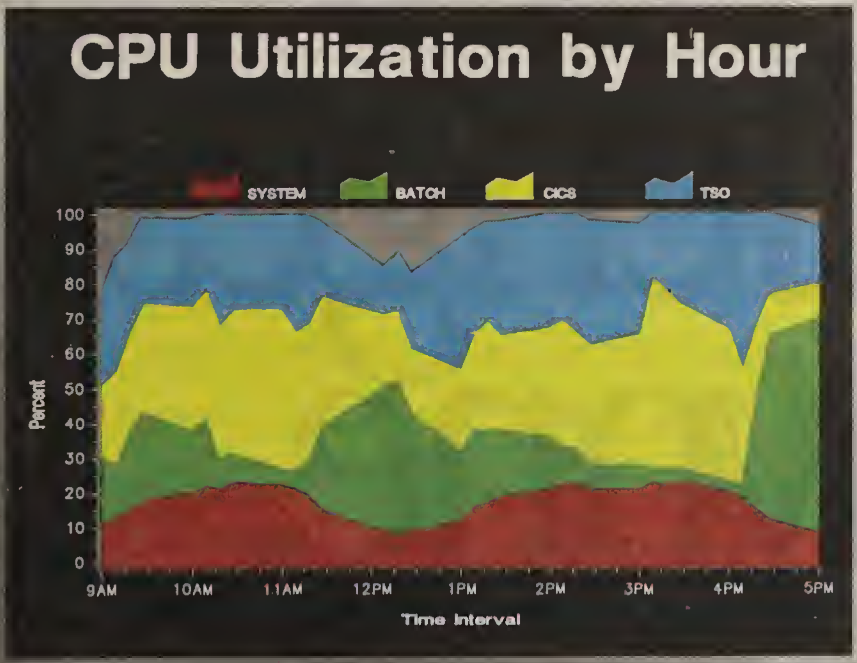
	Southeast	Northeast
Division A	$205,000	$102,000
Division B	115,000	345,000
Division C	225,000	300,000
Division D	165,000	270,000
Division E	225,000	215,000

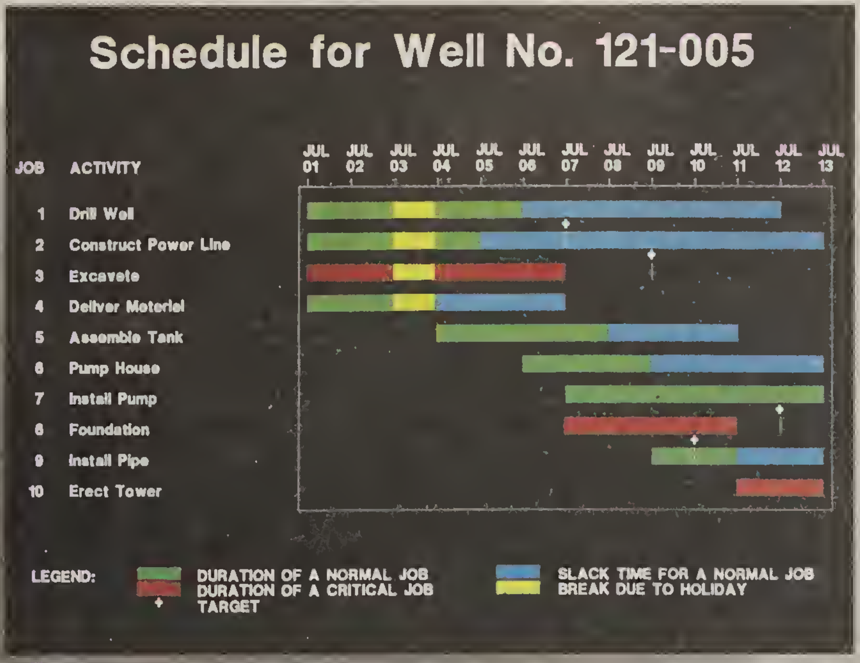

Morgan Cosmetics Inc.
P Chart for Perfume Bottle Capacity

EMS Software International
Countries with Products Installed
As of January 1, 1987


Quarterly Sales

		Actual	Forecast
Northeast	A	$102	$112
	B	$345	$350
	C	$300	$310
	D	$270	$280
	E	$215	$218
	TOTAL	$1,232	$1,270
Southeast	A	$206	$195
	B	$115	$105
	C	$225	$215
	D	$165	$160
	E	$225	$220
	TOTAL	$935	$895
TOTAL BOTH REGIONS		$2,167	$2,165


CPU Utilization by Hour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IBM pushes SAA-Unix links

BY AMY CORTESE
CW STAFF

When it comes to Unix, it has become quite clear that IBM means business — or that Unix means business for IBM. Now IBM is trying to walk down both sides of the street as it announces ties between Systems Application Architecture (SAA) — its collection of proprietary systems tied to standards — and open systems based on Unix.

James Cannavino, president of IBM's Data Systems Group, recently outlined IBM's plans for AIX, its version of Unix, emphasizing connectivity between SAA environments and AIX's role on the mainframe. Cannavino told a crowd that IBM plans to enhance AIX by going beyond industry standards to take advantage of IBM hardware and software strengths associated with each platform. On the high end, IBM will exploit the 3090 vector facility and DOS compatibility features on the low-end Personal System/2.

JOHN MARTINI

IBM's Cannavino

Under this strategy, IBM will adopt the Open Software Foundation's operating base but will go its own way in areas such as a graphical user interface and other extensions. Cannavino said that IBM is committed to both environments and to providing the closest links between them.

Relational database management systems for AIX that are compatible with SAA are critical, according to Jnan Dash, manager of data systems strategy at IBM. IBM's vision is to implement relational DBMSs across all AIX platforms, he said. AIX is currently available on the RT and PS/2 Model 80 and is scheduled to be released for the 370 line under the VM operating system in March 1989. Development of an AIX-based relational DBMS is under way, although IBM would not divulge details.

To physically link SAA and AIX environments and allow data to be exchanged between them, IBM is supporting Transmission Control Protocol/Internet Protocol — the industry-standard protocol in the Unix world for connecting heterogeneous systems — in its MVS and VM operating environments. Likewise, IBM is supporting SAA communications protocols under AIX. For example, LU6.2 is available on the RT.

IBM says its customers, particularly large manufacturers, have requested connectivity between SAA and AIX environments. A scenario that reportedly exists in some IBM sites today has computer-aided design and manufacturing applications running on the RT — for instance, to design an airplane wing — and then uploaded to a mainframe running MVS or VM to simulate flight conditions. Linda Fable, IBM's director of AIX and technical workstations, sees the greatest market opportunities for AIX in manufacturing, the federal government, higher education and distribution.

Cannavino said he sees a big role for AIX in mainframes. He contended that Unix growth has been constrained by being limited to workstations and that as mainframe applications are developed, users will want to take advantage of the mainframe.

IBM has been on a campaign to enlist the development efforts of independent software vendors in beefing up the inventory of AIX applications. In addition to holding an AIX forum this spring attended by 350 software vendors, IBM sent out invitations to 2,500 software vendors offering a free six-month trial of its RT hardware and AIX software.

SQL Performance for OLTP.

Tandem challenges anyone.

Dealer support key to buying plans

Price not as crucial as follow-up service, volume discounts, loyalty

BY ALAN J. RYAN
CW STAFF

Personal computers, peripherals, software and big iron — everything has a negotiable price tag. But when searching for the best deals, MIS leaders said they have a set of considerations a mile long, and price does not top it.

When they are wheeling and dealing for equipment, the MIS managers and purchasing directors interviewed last week said other considerations include service and support, speed of delivery, reputation, past working relationships and general attitude of the dealer or reseller.

All said they feel a certain loyalty to dealers with whom they have had good working relationships in the past. In fact, most said that if they received a lower bid from a competitor, they would give the previous supplier the opportunity to revamp his bid to win the order.

Sometimes, though, the dealer will not change the bid because he knows that the other vendor cannot provide the same level of service, said Peter Cangelosi, manager of computer operations at the Gas Research Institute in Chicago.

Ronald Jenks, partner and director of information services at Touche, Ross & Co. in New York, said the various regional offices of his company can do the buying either through local resellers or through a national distributor selected by headquarters. He said the offices may either use the national supplier or at least have it as an alternative source to hold out as a model for someone they buy from locally to negotiate a better deal.

Important considerations

Some of the questions the managers said they typically ask any potential dealer include the following:

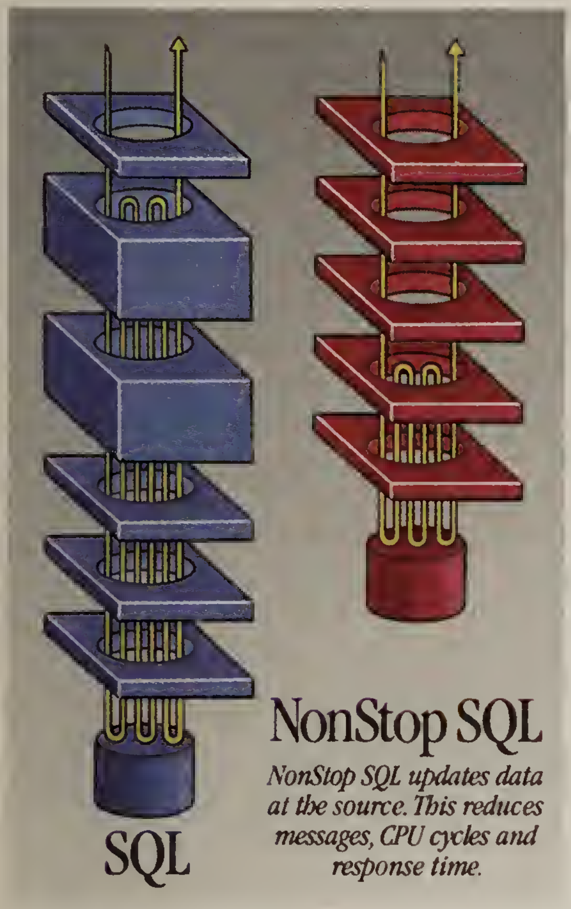
- On the buyer's side — will the dealer preconfigure software and assemble and test equipment? Does the dealer understand the intricacies of the products and provide phone support?
- For consumer protection — will the dealer ship replacement products upon notification that a product does not work? Who pays for the shipping fees if there is no local repair facility?
- For future purchases — will the dealer keep the customer informed of new products and services, and will he help the user to become a beta-test site for new products? Will the dealer lend products for a test period?
- For comparison shopping — does the dealer have a large customer base of similar-size companies? Can the dealer effectively work for a company that has many locations?
- More for the dollar — what volume discounts are offered, and can the dealer offer used or leased equipment?

"If they don't pass the discount hurdle, we don't ask them the other questions," Jenks said. "But we don't have much trouble with that. We are large enough that we don't have much trouble getting large discounts."

Many of those interviewed by *Computerworld* said they do not try to get other options and peripherals bundled in with their hardware purchases.

"If people are trying to throw in other things to help the deal, it sometimes muddies the water as to what you're getting for your money," said Steve Clark, vice-president of information systems in charge of data center operations at Humana, Inc. in Louisville, Ky.

Support is a priority for Matthew Meldon, a microcomputer manager at Trump Plaza Casino and Hotel in Atlantic City. He said he formerly did business with one national chain that would typically return his calls for support the day after he needed it, which was unacceptable. "Supporting my end users means being able to have support available to me," he said.



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The DPS 9000 isn't just the most powerful commercial mainframe on earth. It's over twice as powerful in transaction processing as its nearest competitor: IBM's 3090 series. And unlike the 3090 series, the DPS 9000 incorporates OSI networking standards. So you can feed its power to hundreds of ravenous knowledge workers simultaneously – even in multi-vendor environments.

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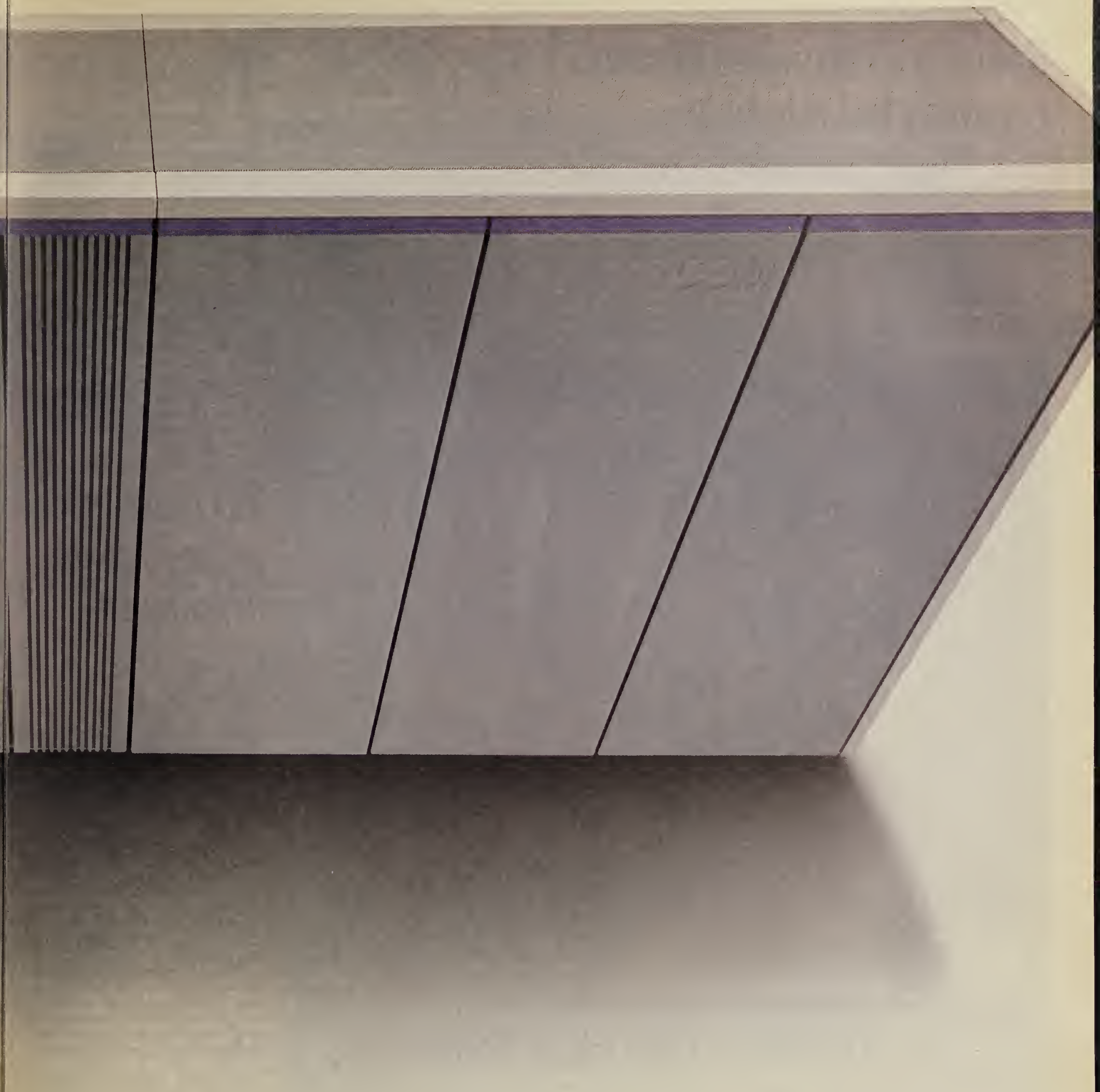

Power Hungry.

17.5 million double-precision floating point operations per second, based on a LINPAC benchmark.

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All this, and the DPS 9000's cost of ownership is 30% less than comparable models in the IBM 3090 series.

Other computer makers claim that they can satisfy power-hungry companies. But compared to the DPS 9000, everything else is just a snack.

For more information about the DPS 9000, including a list of software applications and peripherals that support it, call Honeywell Bull at 1-800-543-6699, Dept. 29.

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Customers are more important than computers.

Comdisco furnishes disaster recovery hot site to go

BY JAMES DALY
CW STAFF

ROSEMONT, Ill. — Comdisco Disaster Recovery Services, Inc. (CDRS) has cooked up a recovery-site-to-go plan that promises the construction of a self-sufficient data processing facility in a customer's parking lot within a week after a computer system unexpectedly goes down.

The Comdisco Mobile Recovery Operations Center, or Comroc, is made up of metal-frame, modular buildings that are slid off a tractor-trailer, rapidly coupled together and set up within days of an unanticipated business interruption, said Greg Rose, president of Comdisco Data Center Development, Inc.

The Comroc facility, which comes in sizes ranging from 1,200 to 9,600 square feet, is equipped with an uninterruptible power supply, diesel generator, wiring, a halon-based fire-suppression system, a cooling system, 15-in. raised floors, alarms, a card-access control feature and a basic communications package.

CDRS, which is a subsidiary of the Comdisco, Inc. computer and high-technology equipment lessor, can also provide the hardware to fill the unit, although those arrangements must be made separately.

Monthly subscription rates for the Comroc service will range from $500 to $2,000 when the service becomes available in the U.S. Jan. 1, Rose said.

After sign-up, Comdisco staffers survey each customer site in advance and draw up foundation and installation plans, so that if the Comroc facility needs to be used, "All we have to do is get it there and put it down," Rose said. The units are then sent out from warehouses in either Southern California or Alabama.

> THE COMROC option eliminates the inconvenience and expense of relocating an MIS staff at a remote cold site for the duration of the recovery process.
>
> GREG ROSE
> COMDISCO

The Comroc option eliminates the inconvenience and expense of relocating an MIS staff at a remote cold site for the duration of the recovery process, Rose said, and can remain in place for however long the customer requires.

Rose said CDRS borrowed the idea from the UK-based Recovery Operation Centres Ltd., which Comdisco recently purchased.

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VDT anxieties prompt spate of rollouts

BY J. A. SAVAGE
CW STAFF

Responding to recent medical studies indicating that the use of VDTs may affect women's reproductive health and may cause premature visual aging in both men and women, several companies used the recent Comdex/Fall '88 show to introduce screens that are said to reduce the suspected causes of the problems.

Norad Corp. in Santa Monica, Calif., claimed its screens, made of plastic, nickel and copper coatings, block 99.99% of the electromagnetic radiation as well as eliminating glare to reduce eyestrain. Norad introduced screens to fit 19-in. monitors and a flexible shield to fit curved monitors. There are eight other rigid-screen sizes available.

Michael Hiles, president of Norad, said that a June study by The Kaiser Permanente Medical Group, Inc. in Oakland, Calif., which found a correlation between use of VDTs and miscarriages, has been a driving force for the screen-protection industry.

Permamesh, a shield of nickel, iron, copper and chrome, was introduced by Stamford, Conn.-based Greenwich Marketing Corp., a distributor for the French company DMS. The flexible screen, much like a retractable window shade, is said to cut glare by 85% and reduce electromagnetic radiation by an unspecified amount.

Sunflex Co. in Novato, Calif., introduced a nylon screen called VDT Environmental Control. The nylon is made electrically conductive to drain static and electromagnetic radiation from screens and discharge it through grounding.

The least expensive alternative is a spray-on glare treatment for the screen from Pacific European Corp., based in Tustin, Calif. Called Glarefree, it sprays on and hardens to give the screen a matte finish. It is not intended to reduce electromagnetic radiation.

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EDITORIAL

Glass not

WHEN AMERICAN INDUSTRY wants to feel good about itself, it draws up comparisons to the maladies of the Soviet economy and its system of distribution in particular.

Everyone has heard the stories about the crates of ball bearings that show up at the pants factory, and late to boot. And then there's the legions of tractors sitting idle in the Ukraine for want of spare parts because the factories had committed to making milking machines.

It seems the semiconductor industry in the U.S. is taking on a Soviet hue these days. It has ramped up three times in this decade in anticipation of demand that went away at just about the time chips were produced in quantity. Then it ramped down with layoffs and undercapitalization, completing the process with an almost uncanny sense of timing — just when demand peaked.

Last week, word came down that Intel, among the most respected of chip makers, had really blown its long-range processor chip forecast and was stuck with excess inventory and a sagging profit outlook. Wall Street struck hard and fast, sending Intel's stock plummeting.

Meanwhile, the chronic dynamic random-access memory chip shortage (hey guys, users want memory — get it, memory) is wreaking havoc in the personal computer industry, with U.S. memory makers eating Japanese dust.

What's wrong? Clearly, the chip business is a very difficult one, with very long lead times required to adjust production significantly. But the more you look at the situation, the more it seems that we just don't do a very good job at one of the key fundamentals of business: forecasting.

Meanwhile, we just may be giving those Ukrainian farmers a good laugh.

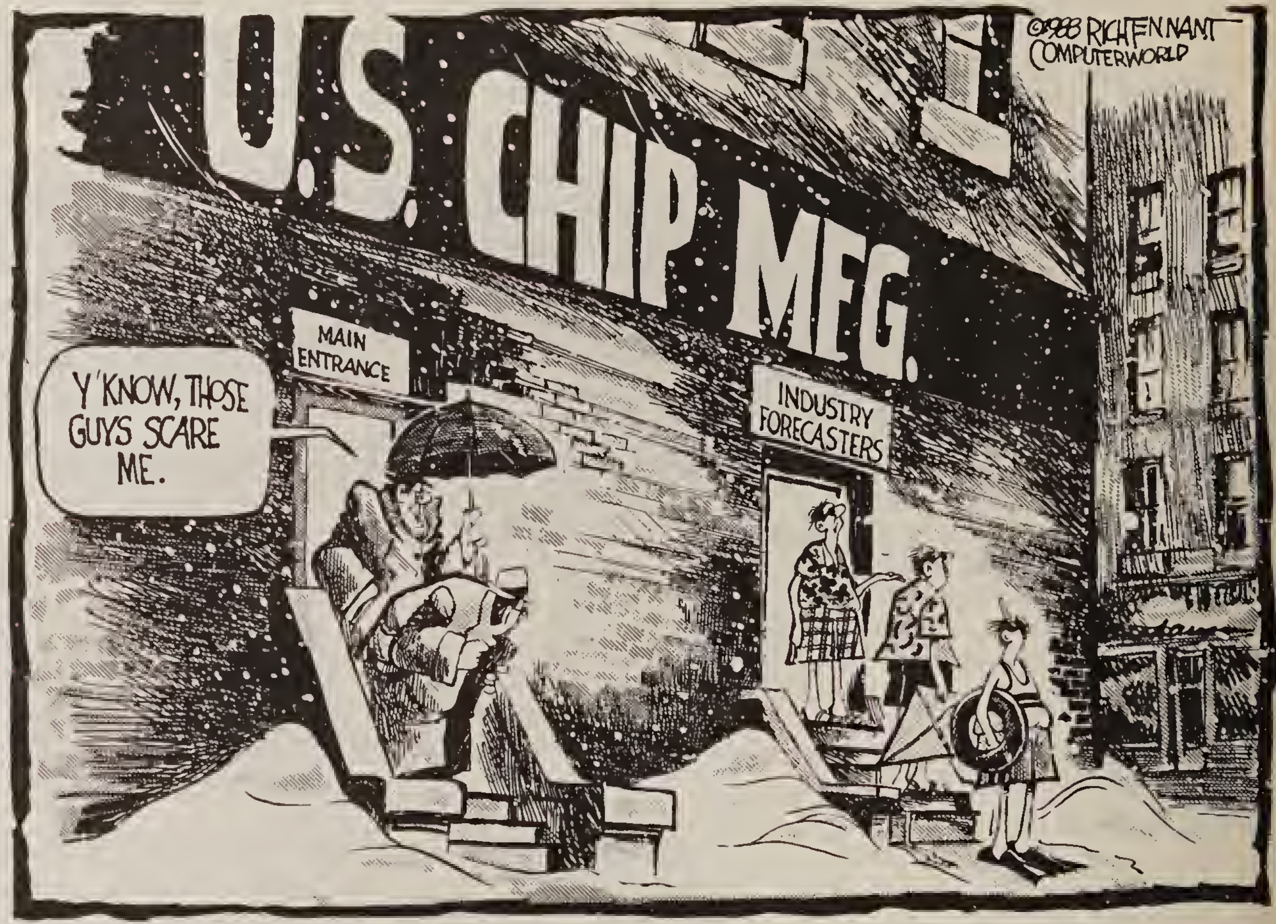
Something new

Four times each year, *Computerworld* sends out 2,000 questionnaires to randomly selected subscribers as part of our ongoing readership research.

Each year, the verbatim comments are heavily laced with fairly equal numbers of criticisms that go like this: "You're too pro-IBM." Or, "You're too anti-IBM." As long as the numbers of each are about equal, we don't grouse.

Clearly, however, the company of greatest interest to a publication written largely for information professionals in medium-size and large organizations is IBM. That firm and IBM-compatible equipment manufacturers account for about 80% of the high-end hardware and 90% of the PCs installed in U.S. businesses.

For these and other reasons, today, *Computerworld* launches IBM Watch (see page 22), a bimonthly column focusing on the most vital issues and trends within the IBM and compatible community. Don't hesitate to let us know what you think of this new endeavor.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Y'KNOW, THOSE GUYS SCARE ME.

LETTERS TO THE EDITOR

Common sense

Regarding your article on the halon/ozone issue [CW, Oct. 3], Fike Fire is a major supplier of Halon 1301 fire supression systems. We certainly do not wish to risk our fragile environment; however, we believe things must be done from a common sense and organized perspective.

The Montreal Protocol divided all potential ozone-depleting substances into two categories. The halons were segregated, as it is recognized that they are a smaller part of the problem and are a substance for which there are no ready substitutes available. In an ideal situation, the halon system will never release its agent unless the protected area is experiencing a fire.

We believe you stopped short of indicating what the Environmental Protection Agency was advocating in its September announcement. EPA clarified that a phaseout of the halons and chlorofluorocarbons by the turn of the century would be a realistic objective.

Great Lakes Chemical Corp. and Du Pont Co. are both aggressively pursuing a substitute that would offer the data processing industry many of the same benefits of the existing halons. It is estimated that it will take five to 10 years before such substitutes can be isolated and made available in commercial quantities. Given this information, the worst thing we could do is throw industry into a panic. The industry is trying to organize a meaningful and responsible transition from one firefighting tool to another.

William A. Eckholm
Group Vice-President
Fike Fire Supression Systems
Blue Springs, Mo.

Local control

Your recent editorial [CW, Oct. 31] gratuitously takes President Reagan to task for "badly trashing support for education." Federal aid hasn't been exactly trashed, but certainly a profound attempt was made by Reagan to change the source and orientation of educational support from the federal government to the states and local governments, who should exercise control.

Few of us believe that Congress knows better than parents and communities' local boards how school aid should be spent. Yet federal aid lugs with it the inevitable federal controls and incompetence acutely pointed up in the decline in test scores accompanying the increase in federal aid during the past twenty years. Textbooks turn to dull mush, and we parents lose our right to influence our children's educational environment.

There is no argument that schools must be supported. But thinking people understand that a dollar paid in local school taxes beats the pants off one from Congress with strings attached.

Robert M. O. Sutton Sr.
Manager, MIS
Allen Corp.
Alexandria, Va.

Oracle does it

Regarding your interview with new Lotus exec Frank King [CW, Oct. 17], he stated, "I don't know of any piece of code in the world today that you can possibly find that runs on VM, MVS, DOS, OS/2, Unix and also a couple of others." At the time I did not write, figuring he had obvious reasons for wishing to claim breakthrough portability by the as-yet unseen 1-2-3 Release 3.0.

I was compelled to write, however, when Senior Editor Douglas Barney commented on the remark without correcting it in his Oct. 31 column.

Oracle Corp.'s Oracle runs on the platforms claimed by King: VM (production in 1982), MVS (1986), DOS (1985), OS/2 (1988), Unix (1980) and "a couple of others," including DOS/VSE and those from Prime Computer, Inc., Honeywell, Inc., Wang Laboratories, Inc., Data General Corp., Control Data Corp. and others.

,, Lotus' movement toward portable software is welcomed by the market. It is, perhaps, strategic in some users' plans. It is not, however, a breakthrough.

Gary C. Dodge
Field Technical Support Manager
Oracle Federal Operations
Denver

We all need race

John Sloan, where have you been [CW, Nov. 7]? On your next consulting assignment, look around you and see how many black computer professionals there are. You will see why there is a need for minority associations.

The Black Data Processing Association is a talented group of people helping each other. I am sure they would let you join.

Dona Leverett
Vice-President
CRS Publications
Fountain Valley, Calif.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Long journey in store for mini-based servers

DALE KUTNICK

Despite nearly a decade of effort, traditional minicomputers have met with only a modicum of success in creating a general-purpose, departmental-processor market within large commercial user organizations.

Indeed, the so-called middle tier of the three-tier hierarchy has been an elusive target except in niches — word processing and electronic mail, technical and scientific and branch automation. The lukewarm response frustrates most minicomputer vendors because not only is the potential market vast, it is critical to their continued growth, which has recently slowed to single digits.

The explosive growth of personal computers and local-area networks during the past three to five years has created both opportunities and pitfalls for minicomputer vendors.

Without question, networked PCs require an intermediary or server to enable the efficient sharing of peripherals, as well as wide-area communications access, LAN management, file management and so on.

But few of the current mini vendors offer enough downward extensibility (in price) or the PC synergy (with IBM's PC-DOS) on their proprietary hardware platforms to attack the LAN server market.

Enter PC-based servers

PC-based LAN servers, utilizing Intel and Motorola microprocessors, have successfully met the current market requirements in price/performance and functionality.

Vendors like Novell, 3Com, Banyan, Apple, Compaq and IBM will drive 1988 PC-server revenues to more than $2 billion. And growth is projected at 30% annually for the next three years. Among traditional mini vendors, only DEC with its Microvax has made any inroads here.

The bottom line is that PC-based servers offer the following advantages over minis:

- About one-third the prices of comparably powered minis, including software and peripherals.
- Easier to install, use and support: A big, networked PC requires little additional support over the stand-alone microcomputers currently in use.
- Most PC users do not really want a mini — they want something that facilitates inexpensive, high-quality, high-speed output (peripheral sharing), information/resource access (communications) and additional storage.
- Easier to buy ("just another PC") via retail channels.

Eroding advantages

Minicomputers still hold a significant edge in availability of sophisticated applications. They also offer better data integrity and security as well as superior shared structures — for multiuser record locking, for example — and communications.

These features are important in top-down — in other words, through MIS — server sales. Minis have had some success in these situations. Most servers, however, are still acquired from the bottom up by a department, and most PC LAN users haven't yet required the more sophisticated functionality that minis provide.

LAN control will shift toward MIS during the next few years as part of an integrated corporate network. But the PC server vendors are prepared. New LAN operating systems such as IBM's LAN Manager, Novell's Advanced Netware, Microsoft's OS/2 LAN Server and Apple's Advanced Appletalk, along with more powerful servers, will be introduced during the next 12 months.

OS/2 and Unix on Intel's 80386 and Motorola's 68030 will enable significantly more functionality to be integrated. Disk-drive vendors are complying with increased capacity requirements by following the commodity market and pushing capacities and performance toward those offered on minis.

Modular microprocessor architectures that enable a building-block multiprocessor approach have yet to appear in quantity, but they aren't far off. Faster I/O on servers will come from embedded reduced instruction set computing (RISC) controllers like Motorola's 68000.

Traditional mini vendors must adopt an OS/2 LAN Server strategy based around commercially available micros and RISC technology to become serious players in the burgeoning departmental marketplace.

Their proprietary hardware and operating systems must take a backseat here and move to other, higher value-added or niche applications. Most mini vendors have already begun this difficult journey and the transformation it demands.

Kutnick is a data processing and communications consultant based in Redding, Conn.

The turbocharged 'RISC market'

EFREM MALLACH

Not a week goes by without new headlines trumpeting reduced instruction set computing (RISC) processor architectures in the marketplace. "RISC market growing fast!" they cry. Every month brings a new research report on "The RISC market," for only $195 (or even $1,950).

But is there really a market for RISC? Or are people simply capitalizing on the latest buzzword?

A decade-old analogy may help us see the answer. When fault-tolerant systems were new, Tandem salespeople were trained to go through a standard scenario whenever a prospect referred to "the market for fault-tolerant systems."

"If there is such a thing as a market for systems that don't break down," Tandem representatives would say, "there must also be a market for systems that do break down."

THOMAS PAYNE

"Sounds reasonable," the prospect would invariably answer.

"In that case," the Tandem representative responded, "vendors selling those systems would rush to tell users, 'See how my system breaks!' Since they don't, there aren't two distinct markets."

Tandem had a point. Fault tolerance is a system feature, along with price, performance and a host of others. People who buy systems that break down do not buy them because failures are desirable. They buy them because they hope to get other things they value more: low price, a particular software package or the perceived security of dealing with an industry leader, all coupled with what they see as adequate reliability for their needs. They are willing to sacrifice even greater reliability to satisfy more important needs.

The fault-tolerance question has been put to rest. Fault tolerance is now recognized as a feature that is of high value in some environments and of less in others. Buyers know that it is not an either/or situation. There are levels of fault tolerance, some of which do not require full hardware duplication.

Now let's apply the same reasoning to RISC. Just as one can estimate the volume of fault-tolerant systems that are sold, one can estimate the volume of RISC products sold. The findings can then be put in a report. Such a report is meaningful to some people, such as semiconductor executives wondering if they should second-source Whizbang, Inc.'s Riscmicro 300.

Does such a report mean there is a market for RISC? Not on your life!

RISC promises advantages to users. It offers cost-performance by cutting seldom-used clutter out of processor designs so that what is left can really fly.

It offers scalability: If Hewlett-Packard wanted to, it could build a Spectrum-compatible handheld calculator. (Putting enough memory and disk storage to run the operating system, let alone applications, in a handheld unit would still be a challenge.) Users like scalable, compatible product lines with good price/performance.

But RISC is not without drawbacks. It requires sophisticated compiler technology that is not yet widespread. HP's experience bringing Spectrum to market suggests that when applied to RISC design, traditional programming methods may not bring out its potential.

Initial benchmarks of the Sun-4 suggest that its Scalable Processor Architecture chip bogs down above a moderate level of multitasking and that some of the reasons may be common to many RISC implementations.

To have or have not

And people are starting to learn that RISC — like fault tolerance — is not a "have it" or "don't have it" situation. Computer architects define RISC by characteristics such as hard-wired control, single-instruction length, single-cycle execution and lots of registers — typically several hundred.

An architecture can have none, some or all of these features. Data General's Nova had most of them two decades ago. Was it a RISC machine? Maybe. Did anybody care? No.

Back to the Tandem scenario. Were there a market for RISC systems, there would be a market for non-RISC — in other words, Complex Instruction Set Computing systems. Vendors of Intel 80386 and Motorola 68000 microprocessors and DEC VAXs would brag about how complex their instruction sets are, that they have a special op code for every function, no matter how obscure, and that some instructions take longer than others to execute. They don't. These vendors talk about more prosaic things, like software availability.

RISC by itself satisfies no needs. It is a feature of a product, not a product. The characteristics of the underlying product should be the basis for purchase decisions.

If a machine's designers found RISC a cost-effective way to achieve these characteristics, more power to them. Conversely, if a product does not have the characteristics we want, then we don't want that product. Whether or not it is RISC-based is a nonissue.

RISC can be a valuable shorthand for a set of pluses and minuses, just as calling a car's engine turbocharged is a well-understood shorthand for performance and fuel economy on the one hand, but high initial cost and potential for failure on the other hand.

When we forget the label is just a shorthand notation and value it on its own or as a buzzword, we get into trouble. The used car ads are full of proof every Sunday.

Users who board the RISC bandwagon without looking to see where it is going and why may end up at someone else's destination.

Mallach is a faculty member at the University of Lowell in Mass., and a consultant to user and vendor executives.

ISIS hands MIS execs a loaded gun

IBM WATCH

MICHAEL
SULLIVAN-TRAINOR

Isn't it interesting that IBM, known for pushing big iron for its own sake, is doing one of the most thorough jobs lately of any vendor helping users connect MIS to business strategy? And the firm is doing it free of charge.

IBM is offering Information Systems Investment Strategies (ISIS), a program that provides the means to analyze MIS investments and present the results in terms chief executive officers and chief financial officers can understand.

For companies already working closely with IBM, ISIS provides enough ammunition to allow MIS to fight for a place in management decisions.

But those who are leery of allowing a vendor too near the decision-making process will find it a difficult program to swallow.

Some 75 marketing staffers, knowledgeable in management, accounting, a bit of psychology and systems usage, form the core of ISIS. These facilitators work with IBM account representatives in 12 regions to recruit ISIS participants. ISIS is headquartered in Stamford, Conn., where classrooms and offices are devoted to educating marketing representatives and users.

Getting to know you

IBM's motive for this investment of manpower and square footage is to accomplish its long-held goal of getting closer to the customer. The most effective sales presentations are those that rely on accurate information about the potential buyer.

This desire to endow marketing representatives with in-depth knowledge about their accounts dovetails nicely with users' needs to knit MIS into the business strategy. Such exposure for the marketing representatives will not hurt IBM during the current period of redeployment, either.

So far, nearly 1,000 MIS organizations have committed anywhere from several hours to several months to ISIS analysis. The program began operation in 1987, with 300 organizations participating in the first year. In 1989, the number is expected to grow to 1,800.

The program entails a multistage analysis of an organization's competitive strategy. MIS managers and their IBM account representatives examine applications using a Personal Computer-based model. Each application is rated based on its relative importance to the business.

The ISIS software model, featuring a multilevel Lotus 1-2-3-like structure, is an interactive program requiring input from MIS and end users. Showing no reluctance to break the Not-Invented-Here syndrome, which sometimes handicaps IBM endeavors, ISIS developers draw on analysis methods from management experts such as Michael Porter and John Rockart as well as industry data from market research firms.

On the MIS side, all that is required is time and the willingness to share parts of the business plan with a vendor. ISIS ranges from full-scale systems investment analysis to simply prioritizing applications and making a business case for a single new project.

Avon Products, in Rye, N.Y., uses ISIS to develop better software project presentations and to assess risks and benefits of undertaking development efforts.

Dollar guesstimate

ISIS enables the company to compare software projects for different business areas using a quantitative method easily understood by management.

The hard part is getting end users to attach dollar benefits to the project from their perspective. Avon's MIS staff had to go back to the users more than once to obtain an estimate of benefits for particular systems.

Avon evaluated a new $10 million marketing system using ISIS and found the project to be the most risky application in its proposed portfolio.

Despite that risk, which required the first application of IBM's DB2 and CSP, the perceived benefits outweighed the arguments for postponing development. ISIS did cause Avon to take a second look at contingency planning and the phasing of the project, according to James Hoffman, director of information services.

Although ISIS requires Avon to let IBM in on the applications evaluation process, Hoffman is not concerned that the vendor is getting too close. "All IBM is really doing for us is running the analysis," he says. "How we accomplish the project and what we do in terms of hardware or software aren't really influenced by the analysis at all."

Chief Information Officer Paul Jara at A. M. Castle & Co. in Chicago uses ISIS to evaluate major projects in terms of their impact on the bottom line. He is also unconcerned about working closely with IBM.

"Obviously, we are an IBM shop. These kinds of services tend to make us do business with them. But we do shop around," he says. "If they don't have the best solution, they don't get the deal."

Non-IBM shops may differ with these users on what constitutes the best solution. Allowing IBM to help analyze systems decisions would no doubt make waves with the non-IBM shop's primary vendor.

Another reason some users are reluctant to accept IBM's free offer of help is that they are not involved in management decisions anyway. Inviting ISIS into the picture means having to address that politically sticky problem directly.

Sullivan-Trainor is *Computerworld*'s senior editor of special projects.

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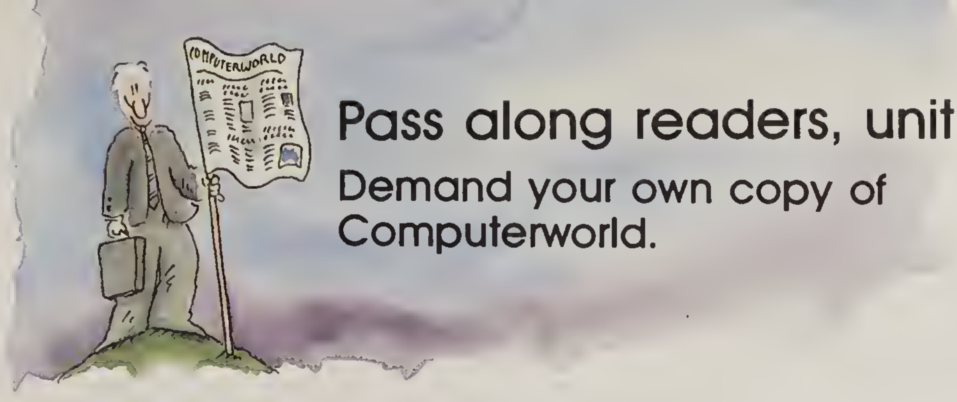

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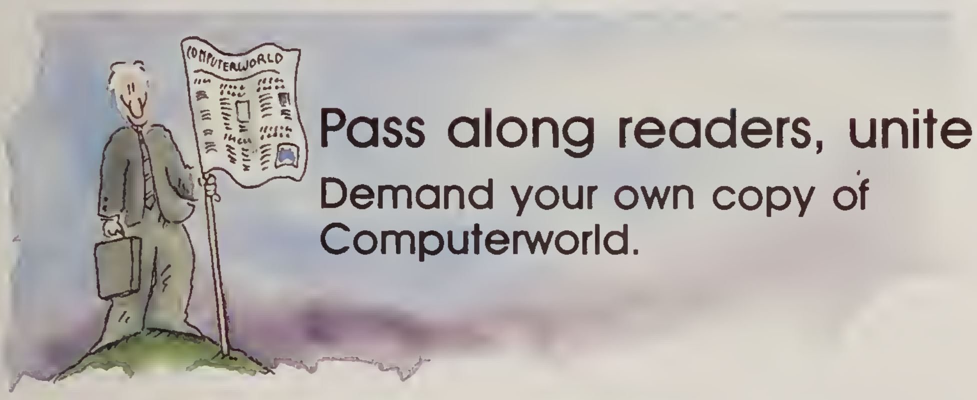

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SYSTEMS & SOFTWARE

SOFT TALK

Remon Lapid

Normalize and save

William Inmon's column "What price normalization?" [CW, Oct. 17] has done readers a great disservice because it has introduced an irrelevant set of arguments to an extremely important issue.

To begin with, Inmon asserts that the debate "has been conducted on a basis of intellectual appeal and intuition." He is dead wrong. The success or failure of large projects is what is at stake.

(Normalization is the decomposition of complex data into simpler data sets and the storage of it on disk; logically related data may be stored in separate sets and in physically different locations, but the need to duplicate that data is reduced or eliminated.)

The whole point of the debate may be restated in the following terms: If I normalize my database, I have the assurance that data duplication is minimized and that there is a way to get data out of my database in a natural way, even for questions we have not yet thought of.

If I denormalize my data, I know that I can optimize the speed of the queries I can think of now at the cost of duplicating some data and at the risk of making new, unforeseen queries more difficult.

The most galling part of Inmon's article is the reference to the study conducted by George

Continued on page 32

ESA realizes early potential

Users await tools but say existing applications helped by operating system

ANALYSIS

BY ROBERT MORAN
CW STAFF

Although early users are eagerly awaiting key tools to bring to life IBM Enterprise Systems Architecture's dormant power, several report performance improvements already.

So far, IBM's performance claims appear to be on the mark, users said. IBM promised hardware performance improvements of at least 12% when it introduced ESA in April. ESA user Donald Egan, chief capacity planner at Provident Life and Accident Insurance Co. in Chattanooga, Tenn., said that his IMS applications perform about 14% better under ESA than under MVS/XA on the two IBM 3090 Model 600E mainframes that ESA throttles.

Egan and others are laying the groundwork for full implementation of ESA, including Systems Managed Storage, and they are spending money for the memory that ESA requires.

More storage

Egan attributed his performance gains to the larger increments of expanded storage (the operating system-controlled silicon memory that serves as an adjunct to main memory) that Provident is using with ESA. In this case, the expanded storage allows the IMS chores to be performed in the CPU memory, diminishing disk accesses.

Similarly, Mellon Bank has examined resource consumption and throughput. ESA has required between 1M and 3M bytes of additional real memory, said Donald Greb, Mellon's vice-president in charge of systems programming. The additional memory costs $8,480 per megabyte. Those additions came as no surprise, and the 5% to 10% throughput increase in IMS, CICS and TSO transactions was worth it, Greb said.

United Services Automobile Association (USAA) in San Antonio churns out about five million IMS transactions per day in addition to running numerous CICS applications. Those transactions were constrained by storage limitations on USAA's principal IMS delivery vehicles, an IBM 3090 Model 400 and 3090 Model 600E. John Fox, manager of central control and the man at USAA responsible for ESA, said he anticipated that the additional power of ESA would carry its own overhead, driving paging rates higher than MVS/XA. To compensate, he purchased

Continued on page 30

Supers: Too much too soon?

BY JAMES DALY
CW STAFF

The supercomputer industry has reached a critical stage in its maturation process.

For years, vendors like Cray Research, Inc., NEC Corp. and Fujitsu Ltd. have continually extended the computer industry's answer to the question of "How high is up?" and stretched the outer limits of computational power with processing speeds now hitting a billion calculations per second.

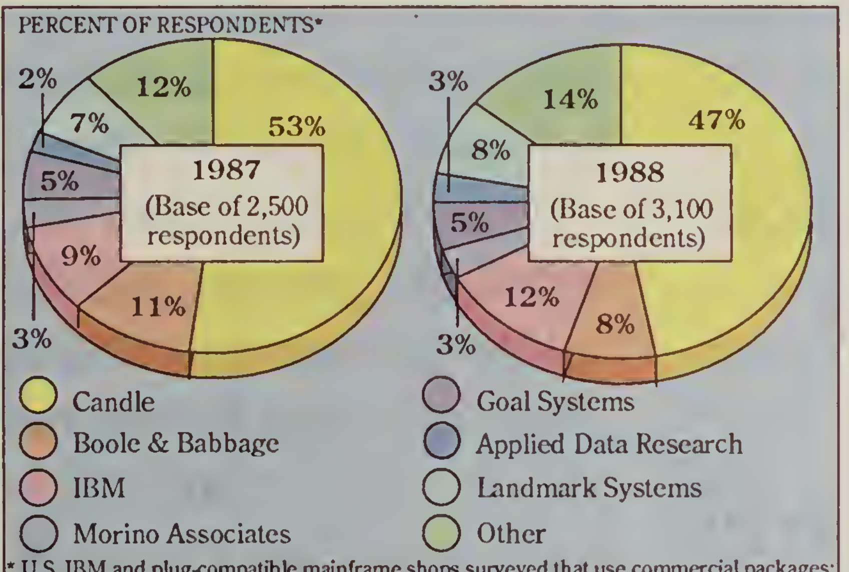
But at the Supercomputing '88 technical conference held recently in Kissimmee, Fla., vendors and users alike expressed concern that they have outpaced

Continued on page 32

Data View

Can't hold a candle

In the performance-monitor software market, no vendor comes close to dimming Candle's brilliance



* U.S. IBM and plug-compatible mainframe shops surveyed that use commercial packages; may total more than 100% because of rounding

SOURCE: FOCUS RESEARCH SYSTEMS, INC.
CW CHART

HARD BITS

Firms attempt to create de facto optical standard

Hewlett-Packard Co., Advanced Micro Devices, Inc., Mitsubishi Electronics and several other companies recently announced their support of a recording format for erasable optical disk cartridges. Their support for the Continuous Composite Servo (CCS) format for 5¼-in. optical disk cartridges, which has not been officially approved by a standards body, is an attempt to create a standard in a market in which there are few official standards.

CCS, the companies reported, has been used by many write-once read-many optical disk drive manufacturers and is the only one being proposed as a format standard in the erasable disk cartridge market. Other companies that announced support include: **Hitachi America, Maxtor Corp., Optotech,**

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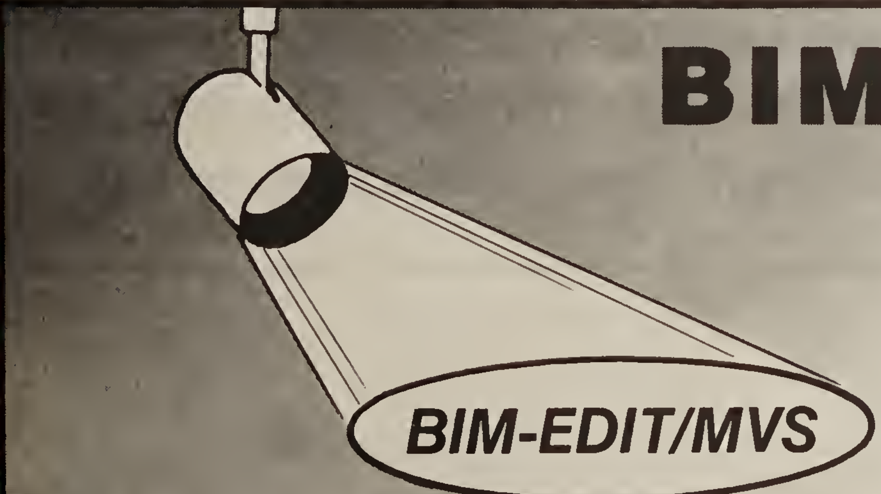
Inside

- IBM's Application Systems Division. Page 29.
- Cray boosts parallel processing availability. Page 29.
- Honeywell Bull expands minicomputer line. Page 34.



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North Africa...U.S. paratroopers on the way to their next mission. (Credit: International News Photos)

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(1) Upgrade offer valid September 6, 1988 through 30 days after the 1-2-3 Release 3 ship date. (2) National Software Testing Laboratories, Inc. Software Digest Ratings Report, June, 1988. (3) 1-2-3 system requirements will vary from Release 2.01 to Release 3. 1-2-3 Release 3 runs under DOS and OS/2; Hard disk and 640K required. Lotus certified compatible PC with 80286 processor or better recommended.

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Cray brings parallelism to Fortran compiler

BY AMY CORTESE
CW STAFF

In an advance that could potentially bring the benefits of parallel processing to more users, Cray Research, Inc. has incorporated a technology in its Fortran compiler that automatically prepares applications to be run in parallel.

The feature, called Autotasking, eliminates the substantial programming effort previously required to run Fortran applications on a Cray parallel processor, the company said. The Autotasking feature is currently shipping with the latest release of Cray's CFT77 Fortran compiler.

Parallel processing can offer significant performance benefits over traditional single-processor computing. However, the programming expertise required to adapt a program to be processed in parallel is often a deterrent.

Typically, programmers either have to restructure a serial program or insert instructions into the program to tell it where to be processed in parallel.

Both of these methods are time-consuming and require an analysis of the program to identify areas that will lend themselves well to parallel processing.

Autotasking performs the analysis and allows the program to run in parallel automatically.

Autotasking handles three major functions. The first analyzes the Fortran program to detect natural points for parallelism and inserts instructions. The second phase restructures the code for parallel execution, and the last phase generates machine-level code from the high-level language.

The Fortan CFT77 compiler with Autotasking is currently shipping to Cray XMP and YMP Unicos customers as a free upgrade. The compiler works only with Cray computers.

SOFT NOTES

HP to resell Frame's tools

Hewlett-Packard Co. will resell San Jose, Calif.-based Frame Technology Corp.'s professional publishing software under terms of a recently penned software licensing agreement. The Framemaker software products will be available on HP's Unix-based 9000 Series 300 and reduced instruction set computing-based Precision Architecture workstations. The software will sell for $3,000 to $4,000.

Information Resources, Inc. in Waltham, Mass., introduced a version of its Express decision support system for the Digital Equipment Corp. VAX line. The software has been available for IBM, Prime Computer, Inc. and Hewlett-Packard Co. computers.

The VAX version, called Express Multidimensional Database (MDB), combines a fourth-generation language, development tools and end-user analysis tools. Express MDB will work with DEC's All-In-1 as well as common personal computer spreadsheet and graphics software. Prices for Express MDB for the VAX start at $70,000.

IBM unit turning the corner

Application division works with third parties to boost software offerings

IN PERSON

First in a two-part series.

ANDY FREEBURG

IBM's *Guglielmi articulates the shifting divisions*

In 1987, IBM launched the Application Systems Division (ASD), its first major software effort, and positioned it as the caretaker of the company's software strategy. In 1988, ASD was swept up in an overall corporate reorganization that took away its role of the premier software group. But according to Joseph Guglielmi, the IBM vice-president in charge of ASD, the group is still at the center of IBM's software strategy and is pursuing its original goal of coordinating IBM's international software efforts.

In an interview with Rosemary Hamilton, *Computerworld's* senior editor of systems, Guglielmi discussed ASD's new corporate role, looked at ASD's achievements to date and outlined what is ahead for next year.

Earlier this year, ASD was merged into a group, Application Solutions, and another group, Programming Systems, was created to have primary responsibility for IBM's Systems Application Architecture (SAA), which was ASD's responsibility. What does this mean for ASD?

That question is one that comes up a lot. It hasn't changed at all from an external point of view. Let me close the loop on what happened in April. We formed a Programming Systems line of business, formed with a piece of ASD, which had a focus on two major areas: tools, commonly called CASE, and . . . the SAA underlying elements, like the dialogue manager. They were put together in a business unit under Earl Wheeler. So, he is a gearbox now internally for SAA, trying to drive a consistent strategy across all the lines of business. That was split before between two of us.

Why was SAA responsibility taken out of ASD and placed with Earl Wheeler, who heads up a separate division?

It was never totally in ASD. SAA was really jointly shared between ASD and four or five other lines of business. What IBM did was put one person in charge of the SAA strategy. The second thing it did was combine all the elements of CASE in Earl's shop to provide a much sharper focus. That was also split among business units.

I am still wondering why you could not have a very sharp focus on SAA within ASD. One could think that this change is taking away responsibility from ASD.

You could look at it that way, but I'm going to talk about some things that have been added to ASD also to balance that. It isn't taking it away. We still retain the responsibility for packaging SAA externally to our customers and to our software vendors. We're

Continued on page 30

CICSORT

Syllogy announces an online sort
that will bring down the house instead of the system.

CICSORT FROM SYLLOGY. ONLINE SORTING FOR THE FIRST TIME EVER. For years no one would even think of doing a sort online. Because calling the batch sort would cause CICS to crash. That's about to change. Introducing CICSORT™. A remarkable new technology that now makes it possible and practical to sort online. **FAST.** CICSORT lets you get critical reports faster than ever. No more waiting for batch reports. Transfer them online. Create new reports in CICS. Or upgrade unsorted reports. **EASY.** CICSORT is called by the standard COBOL Sort verb. Programmers can put it to work immediately. And it's fully compatible with the CICS preprocessor, the OS/VS and VS COBOL II compilers and all versions of CICS. **EFFICIENT.** CICSORT is designed to operate at peak efficiency under CICS. Without affecting the performance of other jobs. **PHONE.** Find out what CICSORT can do for you. Call to receive our free booklet about online sorting and ask about our 30-day free trial. **TO LEARN MORE WRITE OR CALL 1-201-343-8900.**

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ESA

CONTINUED FROM PAGE 25

128M bytes of additional expanded storage for $595,000.

Despite the performance boosts already seen with ESA, Mellon's Greb and Provident's Egan said that ESA has yet to substantially change their operations. Both are doing the legwork in preparation for future changes, however.

Greb, for example, is examining all of his applications to determine the best candidates for ESA. According to Greb, those applications will be based on IBM's CICS and DB2, which stand to derive the biggest benefits because they are I/O-intensive. ESA moves those applications into memory and trims the amount of disk access, eliminating a performance penalty, he said.

Egan said that by the beginning of the year, he will place IMS data in ESA's high-performance spaces, known as hiperspaces, which outperform standard paging by remaining in expanded storage until called into memory in 4K-byte segments.

Hiperspaces require the use of Data Facility Product, a key component in IBM's Systems Managed Storage that automates many storage tasks and complements performance gains in the CPU. Mellon's staff is now following IBM guidelines regarding such functions as volume pooling and service levels for data sets, according to Greb.

Although applications developers will not need additional training to work with hiperspaces and Data Facility Products, database administrators will, Egan said. He said he expects his full implementation to cover two years.

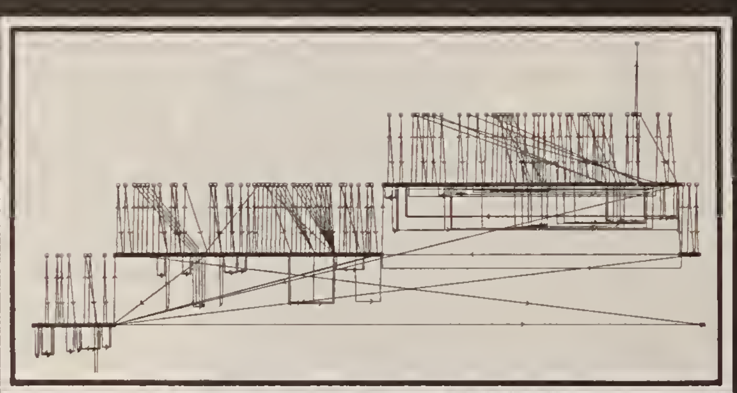
Also, Egan said he is eager to use DB2 Version 2 with ESA compatibility. The release, anticipated in December, will better accommodate the huge relational tables that DB2 production systems require.

Prototyping of applications has changed significantly at both organizations because of IBM's Processor Resource/Systems Manager (PR/SM). PR/SM permits as many as six partitions on 3090 E and 3090 S uniprocessors and 12 partitions on multiprocessors.

According to Egan, the partitions carry about an 8% overhead on the mainframe but have reduced Provident's prototyping time from the usual six weeks to two weeks.

Similarly, Greb uses PR/SM to devise a systems programming test machine. Previously, Mellon used the software capability of VM to create multiple guest machines. Greb said that he abandoned the VM solution because "PR/SM is cheaper and less complicated to use." With the VM solution, he said, operators had to learn additional procedure vocabularies.

But the power of ESA and the costs associated with it may change charging structures within organizations. Mellon will implement a chargeback structure, Greb said, "given the increased costs of software and memory under ESA."



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IBM unit

CONTINUED FROM PAGE 29

aggressively involved from three points of view. We're developing some of the SAA tools. We're taking all of IBM's applications to SAA compliance. So we're implementing SAA.

We are driving a set of support programs to get vendors committed to SAA. So all we've really done was, for efficiency reasons, we've put a little more of the actual SAA elements, like the dialog manager, in one place.

When you sort through it — while every organization kind of has a give and take — on balance, I'm very comfortable with it. I think it's exactly the right thing for the corporation to do.

What would you identify as ASD's achievements since its formation in 1987?
I think we've made tremendous progress in just a little over a year. We have in place at IBM a comprehensive worldwide application strategy, and while the industry hasn't seen that roll out fully yet, I will assure you the effects of that investment I've been making over the last year will become very evident in the fourth quarter and in 1989, at which time you will see a barrage of new application solutions from IBM.

We have a worldwide set of investments in place. We are now providing application development in Europe. We're doing development in the U.S., which we're planning to market worldwide. All that's in place and working well.

We've also substantially increased the number of resources IBM has committed to application software development and our application strategy.

Our growth in ASD, while the company has been restructuring itself, [the staff has] grown almost 20% in a year in terms of the number of application programmers who are now either acquiring or writing or working with third-party people to provide solutions to our customers.

Now, the No. 2 objective is to increase the number of working relationships and the amount of software we are procuring from the outside.

A year ago, we had some 20 or 24 relationships in place. Today, we have over 125 business relationships with a variety of third-party software providers.

We also have a very aggressive set of programs that have been implemented to encourage third-party vendors to be compliant with SAA.

Thirdly, we have in place today a world-class support structure for application software. A year or so ago, there were probably only 20 or 30 people worried about support for application software.

Today, I have about 150 people whose only job is to put in an electronic support structure worldwide, which will support all of the ASD-provided applications.

When you mention that you've put in place this worldwide strategy that we haven't seen yet but will become evident soon, what more can you tell us about it?
We're focusing specifically on three major areas.

One is office systems. About one-third of the division's resources focus on providing IBM office systems products, both maintaining today's products and putting in place a future office system strategy.

That group has been investing heavily in a product set that will be fully SAA-compliant and have the integrated look and feel that our customers have been requiring of us over the last couple of years. You'll see some of this strategy become visible certainly early next year and throughout 1989. It'll build off our current office system products.

Office systems, in the future, will not be classically text. We envision an office platform that allows our customers to plug in their industry-specific applications as well as other applications into a comprehensive management structure for their business. That is a major shift in our office strategy, and we're far along on executing that.

The second major area is computer-integrated manufacturing. We have a tremendous focus on this, another 25% of our resources.

It covers three areas: CAD; production planning and control; and shop floor, where we haven't been as strong as I would like.

We've made great progress in a year. We have an internal set of resources working with IBM's manufacturing plants to use the same products we're developing for our customers externally. This year, my CIM business unit is way above its plan.

The third area is in selected industries. The three we're focused on are health, banking and distribution. We had major development efforts going in those areas, and we continue to invest in them. All of those strategies are augmented heavily by the use of third-party software packages and relationships.

For example, in CIM, over half of the applications — probably 60% that we have been shipping and will ship in the future — will be developed by third-party vendors in some kind of relationship with IBM.

Hard bits

CONTINUED FROM PAGE 25

Inc. and Western Digital Corp.

Maybelline has purchased a **Tandem Computers, Inc.** Nonstop VLX fault-tolerant system as part of its plans to automate its Memphis factory. The company is implementing the Tandem Integrated Manufacturing Environment, which also includes software from Management Science America, Inc.

ETA Systems, Inc., the supercomputer subsidiary of Control Data Corp., recently sold systems to the following companies and organizations: TRW, Inc., Ford Motor Co., NASA, the Goddard Space Flight Center, Pulsonic Technology Corp. and Professional Geophysics, Inc.

Data/Ware Development, Inc., a maker of optical storage subsystems, signed a third-party maintenance agreement with National Advanced Systems, a subsidiary of National Semiconductor Corp. Under the agreement, NAS will provide installation and hardware maintenance to Data/Ware U.S. customers for the Data/Ware DW 34800 optical storage subsystems that work with IBM and plug-compatible mainframes.

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Lapid

CONTINUED FROM PAGE 25

Coleman. With apologies to Mr. Coleman, my paraphrase of Inmon's explanation follows:

Suppose I want to print an invoice. Do you think it would be faster to look up an invoice and then, from the customer number, retrieve the customer record for the name and address or look up an invoice record that already has the customer's name and address on it?

Come on — the real issue is not whether denormalizing can be faster for some applications. Taking the scenario above, suppose the next question was, "Now what do you do if a customer changes his address?" All of this customer's invoice records need to be changed. And where else did you put the customer's address? Are you sure you remember? What programs are affected? How long will it take to correct them if the length of the address needs to be increased? These are the real-life questions that need to be addressed.

Incidentally, I can show you real-life applications in which normalized databases will perform better than denormalized ones. It depends on the patterns of access and the size and physical layout of the database.

For example, consider a very large database of auto parts for a small number of automobile models. You may think that placing the name of the car along with the parts record would save you from having to look that information up. It does, but the extra time spent moving an arm across the surface of a disk to get to the right record results in a loss in comparison with the normalized method.

Second access

How about the second access? First of all, if the car table is small, it may be cached in memory. But even if that were not the case, I would recommend placing the car table on another spindle so that you could be searching for both the car and the part simultaneously, thus avoiding the penalty of looking up two entries. It all depends on the situation.

To make the statement that "normalization costs from 100% to 400% of denormalization" is nonsense. But the crucial question Mr. Inmon never addresses is, "What is the cost of not normalizing?" No one would argue that assembler code can be substantially faster than Cobol, for example. Does that mean that we should be writing our business applications in assembler? Think of how much faster they would run. And maintenance, already a nightmare in most large shops, would be virtually impossible.

That is exactly why we should consider normalizing our databases. You have to put a price on maintenance as well, and that is where normalization shines. '

Lapid is president of The Software Foundry, Inc., a New York consulting firm specializing in software for high-performance workstations.

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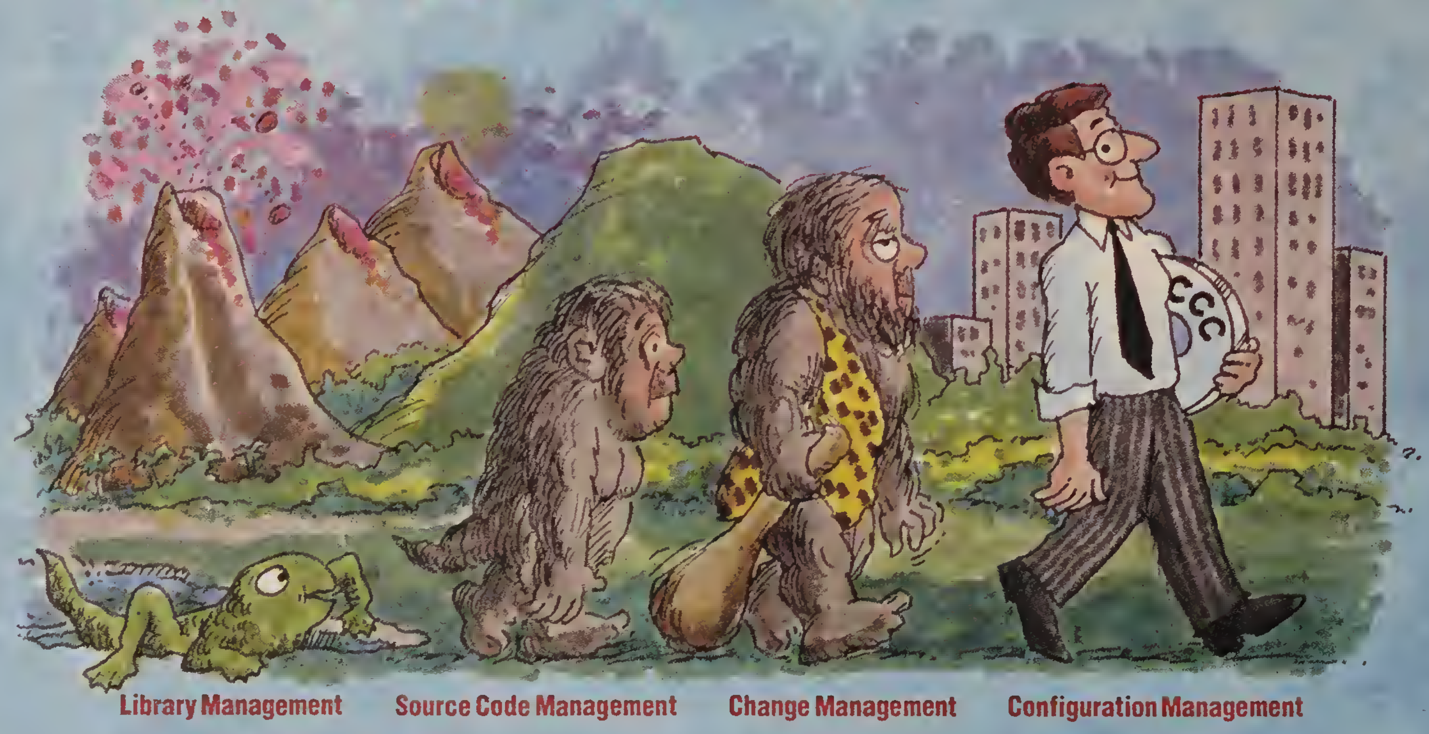

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Supers

CONTINUED FROM PAGE 25

the industry they hope to lead.

The result is a double-edged challenge. Not only must the industry address the dearth of connectivity options and application software for current platforms, but it must also figure out ways to move the immense power of the machines down to the desk top and make it available to a wider range of users.

"Catering to the customer with a latent desire for the newest, biggest or fastest will not produce sales," said J. Richard Sherman, president of Research Consortium, Inc., a market research firm that concentrates on high-performance computing.

Although there will always be organizations such as the National Aeronautics and Space Administration that have their checkbooks handy whenever the latest supercomputer arrives, many feel that the most pressing challenge now facing supercomputer vendors is that of bringing the power of their machines to the less technologically sophisticated end user.

Cray Chairman John Rollwagen said at a press conference during the show that his Minneapolis-based firm would do that by going into the applications software industry. "We see our critical challenges not just in delivering high-speed computers but in making that power available to the user in an intuitive form," he said. "We want to turn the supercomputer business into the PC business."

But Rollwagen admitted that Cray cannot necessarily do that by itself and hinted that strategic alliances will be announced in the near future.

IBM said it hopes to move power to the desk top by simultaneously increasing the power of its desktop machines while it puts an increased product emphasis on the open Unix operating system. "We plan on opening up our large host-based offerings like MVS and VM to more closely cooperate with Unix-based workstations networks," said E. H. Robbins, director of scientific and technical computing at IBM.

Another perennial problem dogging vendors is the ability of communications standards to keep pace with their high-speed hosts. The emerging Fiber Distributed Data Interface (FDDI) standard — whose 100M bit/sec. data transfer rate will leave the current 10M bit/ sec. Ethernet rate in the dust — will alleviate some of that problem. However, many FDDI products are not expected to reach fruition until 1992.

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If you need the benefits of Data Pac technology in a full-size machine without the cost of a 386 processor, there's the Tandon 286 featuring a high-performance 12MHz 80286 processor along with all the great features of the Tandon 386.

Make a personal investment in the future with Personal Data Pac technology. Contact Tandon Computer Corp., 301 Science Drive, Moorpark, CA 93021 or call Tandon today.

1-800-228-8595

Tandon

GSA# GSOOK87AGS6049 OPT1
Tandon 286 not available until 1989.

PAC 286 and Personal Data Pac are trademarks of Tandon Corporation. Information correct at presstime.

NEW PRODUCTS — SYSTEMS

Processors

Honeywell Bull, Inc. has expanded its DPS 6 Plus minicomputer family with the addition of the **Model 201** entry-level computer. The 32-bit, virtual-memory system was designed to provide low-cost processing capabilities for small departmental environments, according to the vendor.

The processor performs as an end point and can serve two to four users in a networked environment. Prices range from $14,000 to $17,500.

Honeywell Bull, 200 Smith St., Waltham, Mass. 02154. 617-895-6000.

Data storage

Micro Technology, Inc. has introduced its **6200** series of high-capacity storage arrays.

The units were designed to provide users of Digital Equipment Corp. distributed systems architecture-based controllers and servers as well as DEC Microvax users with storage capabilities in a 5¼-in. form. They are said to feature built-in 8mm 2.3G-byte tape cartridge backup and are available in capacities ranging from 565M bytes to 20G bytes.

The 6200 series is priced from $23,000 to $388,000.

Micro Technology, 1620 Miraloma Ave., Placentia, Calif. 92670. 800-999-9684.

A solid-state disk device capable of supporting eight storage directors in an IBM mainframe multiprocessor environment has been announced by **EMC Corp.**

Called the **Orion/VL**, the product enables users to access eight different CPU channels simultaneously, the vendor said. The unit provides from 16M bytes to 3.5G bytes of high-speed electronic storage, and custom daisy chaining of units is available to exceed single-unit limitations. Support is offered for single, dual, quad and octal directors.

The Orion/VL, in its initial configuration with one director, is priced at $23,000, with a per-megabyte price of $1,400. Additional directors can be purchased at $5,000 each.

EMC, 171 South St., Hopkinton, Mass. 01748. 800-222-3622.

I/O devices

Planar Systems, Inc. has introduced an 18-in. diagonal flat-panel electroluminescent display. Designated the **EL751214M**, the monochrome panel reportedly has a matrix of 1,024 by 800 pixels and weighs less than 15 pounds, according to the vendor.

The unit is capable of sustaining 50 Gs of shock, the vendor said, and operates over a wide temperature range that makes it especially suitable for rugged military applications.

The EL751214M costs $20,000.

Planar Systems, 1400 N.W. Compton Drive, Beaverton, Ore. 97006. 503-690-1100.

Power supplies

Burr-Brown Corp. has unveiled a 32-channel Motorola, Inc. VMEbus relay output board that reportedly handles current signals to 2A.

The **MPV903** features a field-to-bus isolation of 600V DC and channel-to-channel isolation of 300V DC.

The MPV903 costs $1,185.

Burr-Brown, P.O. Box 11400, Tucson, Ariz. 85734. 602-746-1111.

A three-phase power line monitor is now available from **Dranetz Technologies, Inc.**

The **Model 646-3** reportedly monitors sags, surges and impulses. A separate DC channel is also included for correlation of DC voltage aberration to AC disturbances.

The unit costs $3,800.

Dranetz, 1000 Durham Road, CN-91, Edison, N.J. 08818. 201-287-3680.

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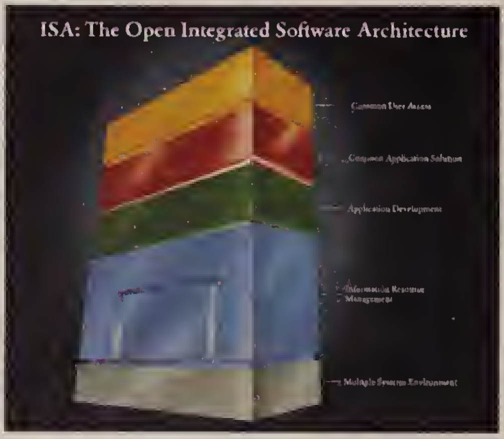
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- ▲ Full Data Portability—just eject the Data Pac and take it with you

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The Ad-PAC is an easy-to-install receptacle that takes Personal Data Pacs and is available at a special introductory price of $998, including one Personal Data Pac, until December 31, 1988. And if you need more storage, 30MB Data Pacs are available for only $399.

Taking your past and making it part of the future has never been easier. The Tandon Ad-PAC is your path to the future. For further information, contact Tandon Computer Corporation, 301 Science Drive, Moorpark, CA 93021 or call Tandon today.

1-800-228-8595

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NEW PRODUCTS — SOFTWARE

Development tools

Sybase, Inc. has announced a set of application productivity tools for designing, prototyping, building and maintaining forms-based, on-line applications.

Called **APT Workbench,** the product was designed to be a window-based application development tool for client/server computing environments. Running on Sun Microsystems, Inc.'s workstations under Unix and Digital Equipment Corp.'s VAX/VMS machines, the product is scheduled for delivery in the first quarter of 1989. Pricing will start at approximately $3,200.

Sybase, 6475 Christie Ave., Emeryville, Calif. 94608. 415-596-3500.

BBN Software Products Corp. has announced **RS/Decision**, an expert system shell that is reported to be fully integrated with the company's RS/1 data analysis system and RS/QCA quality control software.

The shell is easy to learn, the vendor said, and includes menu-driven utilities for building, maintaining and accessing knowledge bases. It runs on Digital Equipment Corp. VAX/VMS systems and Sun Microsystems, Inc. and Hewlett-Packard Co. machines.

Scheduled for release in the second quarter of 1989, the program will be priced from $2,000 to $30,000, depending on system configuration.

BBN Software, 10 Fawcett St., Cambridge, Mass. 02238. 617-864-1780.

An automated software testing tool has been announced by the Systems Software Marketing division of **Sterling Software, Inc.**

Sterling Autotest is reported to be a personal computer-resident program that allows technicians to plan, create and play back test scenarios on any mainframe, mini or microcomputer program regardless of the transaction-processing monitor or hardware platform. It is priced at $4,000 per single CPU.

Sterling, No. 100, 11050 White Rock Road, Rancho Cordova, Calif. 95670. 916-635-5535.

Data Access Corp. has begun shipping **Dataflex 2.3B.** It is reported to be a transportable database system that provides the combined functions of a programming language, a relational database management system and a full set of utilities.

The latest release was developed for the AT&T Unix System V, Release 3/386 and The Santa Cruz Operation's SCO Xenix 386 operating environments.

Dataflex 2.3B is priced from $1,800 to $26,600, depending on the number of users.

Data Access, 14000 S.W. 119th Ave., Miami, Fla. 33186. 305-238-0012.

Mechanical Dynamics, Inc. recently announced a kinematic and dynamic analysis package that runs across several hardware platforms, including those from IBM, Digital Equipment Corp., Sun Microsystems, Inc., Apollo Computer, Inc., Cray Research, Inc. and Silicon Graphics, Inc.

According to the vendor, **Adams+** will allow engineers to develop and analyze mechanism models at a faster rate. The typical price for an Adams+ software license to run on a graphics workstation is $45,000 paid in full and $15,000 for an annual license.

Mechanical Dynamics, 3055 Plymouth Road, Ann Arbor, Mich. 48105. 313-994-3800.

Applications packages

An integrated applications package developed for Microsoft Corp. MS-DOS and Unix environments is available from **Decathlon Data Systems, Inc.**

Dubbed **Goldmedal**, the software reportedly includes word processing, three-dimensional spreadsheet, relational and transactional database as well as graphics presentation and other functions.

The single-user DOS version costs $495.

Unix versions range from $1,495 for Intel Corp. 80386 Unix and Xenix to $42,000 for mainframes and superminicomputers.

Decathlon Data Systems, 1650 38th St., Boulder, Colo. 80301. 303-440-9000.

Cincom Systems, Inc. has announced **Control:Manufacturing Release 6.3** for use with Digital Equipment Corp. VAX machines and IBM systems.

The package was designed as a complete manufacturing management system incorporating 15 integrated modules. The latest release provides a Project Cost Control (PCC) module to allow project definition and budgeting, actual cost collection and audit and status and analysis reporting, the vendor said.

The price range for the PCC module is approximately $45,000 to $80,000, depending on hardware platform and configuration.

Cincom, 2300 Montana Ave., Cincinnati, Ohio 45211. 513-662-2300.

A **Travel and Expense Reporting** program for IBM and plug-compatible mainframe and mini users has been announced by **Global Software, Inc.**

The software reportedly runs in a cooperative processing environment and accumulates management information for analysis.

The product costs $12,500 as an add-on to the company's accounts payable system.

Global, 1009 Spring Forest Road, Raleigh, N.C. 27615. 800-366-7890.

Structural Dynamics Research Corp. has announced that its mechanical computer-aided engineering software products are now available to run on the Convex Computer Corp. C1 supercomputer.

I-Deas Model Solution and **I-Deas Optimization** are used specifically for finite element analysis, the vendor said, and cost $8,000 and $6,000 per user, respectively.

Structural Dynamics, 2000 Eastman Drive, Milford, Ohio 45150. 513-576-2400.

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1. **BUSINESS/INDUSTRY** (Circle one)
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   - **20.** Finance/Insurance/Real Estate
   - **30.** Medicine/Law/Education
   - **40.** Wholesale/Retail/Trade
   - **50.** Business Service (except DP)
   - **60.** Government — State/Federal/Local
   - **65.** Communications Systems/Public Utilities/Transportation
   - **70.** Mining/Construction/Petroleum/Refining/Agric
   - **80.** Manufacturer of Computers, Computer-Related Systems or Peripherals
   - **85.** Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
   - **90.** Computer/Peripheral Dealer/Distributor/Retailer
   - **75.** User Other ____________
   - **95.** Vendor Other ____________ (Please specify)

2. TITLE FUNCTION (Circle one)

   IS/MIS/DP MANAGEMENT
   - **19.** Vice President Asst VP
   - **21.** Dir , Mgr Suprv , IS/MIS/DP Services
   - **22.** Dir , Mgr Suprv , of Operations, Planning Adm Services
   - **23.** Dir , Mgr Suprv , Analyst, of Systems
   - **31.** Dir Mgr , Suprv , of Programming
   - **32.** Programmer, Methods Analyst
   - **35.** Dir , Mgr , Suprv , OA/WP
   - **36.** Data Comm Network/Systems Mgt

   OTHER COMPANY MANAGEMENT
   - **11.** President, Owner/Partner General Mgr
   - **12.** Vice President/Asst VP
   - **13.** Treasurer, Controller Financial Officer
   - **41.** Engineering, Scientific, R&D Tech Mgt
   - **51.** Sales/Mktg Mgt

   OTHER PROFESSIONALS
   - **60.** Consulting Mgt
   - **70.** Medical, Legal, Accounting Mgt
   - **80.** Educators Journalists Librarians Students
   - **90.** Others ____________ (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor or consultant
   - **A.** Mainframes/Superminis
   - **B.** Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
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Michael Alexander

Don't kiss IS guy goodbye

Stand on any street corner in any big city in the country and before long an analyst will come by and tell you that by the mid-1990s, every white-collar worker in the nation will have a personal mainframe on his or her desktop.

What's more, personal computers will be so cheap by then that information services managers will be able to buy them by the carload, the analyst is apt to say.

Having this much cheap horsepower at their fingertips is bound to get more than a few end users humming songs like "Power to the People" and "Hey Hey Kiss Him Good Bye" as the MIS manager walks by.

At least, that's the scenario one analyst painted for me while I was hanging out in downtown Boston one day last week.

High-powered personal computers are proliferating like rabbits, he said. But the problem with stand-alone PCs is that they do not work like people work, that is, in communication with each other. So now, PC networks are proliferating like rabbits.

So what's the big deal? I re-

Continued on page 48

Users stuck on Windows for now

BY MICHAEL BALL
SPECIAL TO CW

Users are not rushing to convert their Microsoft Corp. Windows applications to the recently released IBM and Microsoft Presentation Manager with OS/2 Release 1.1, even though such a conversion would get them around the 640K-byte random-access memory limit and allow a greater range of multitasking applications.

"We're using [80386-based PCs] with Windows as a placeholder," stated Art Block, a vice-president at Manufacturers Hanover Trust Co. in New York. As with many large users, his bank's long-term strategy includes Presentation Manager but is in no hurry to move to it.

Similarly, at Fidelity Investments in Boston, MIS staff members have heard the call of Presentation Manager but are not rushing to convert applications.

"We briefly looked at Presentation Manager on top of OS/2," said Jim Stoddard, Fidelity's senior vice-president of strategic systems. "We saw how much money it would take and decided it was not the platform yet."

It's in the price

Stoddard said he was favorably impressed with Presentation Manager's specifications and unfavorably impressed with the cost of Intel Corp. 80386-based hardware, particularly memory chips and boards.

"Sure, we would like the clean address space and not running into the 640K limit, but the price of memory and hardware to run Presentation Manager precludes it," he said.

Fidelity will continue to be what Stoddard called "aggressive Windows developers," until the market matures enough to suit it. He noted that when he first heard of Presentation Manager, he was expecting memory prices to continue their steady decline. Instead, he found that Presentation Manager's ideal platform is a 386 with 8M or 12M bytes, which he defined as "not yet affordable."

"By 1992, I see platforms declining in price, driven down by the availability of the 486, and with memory reasonably priced," Stoddard said.

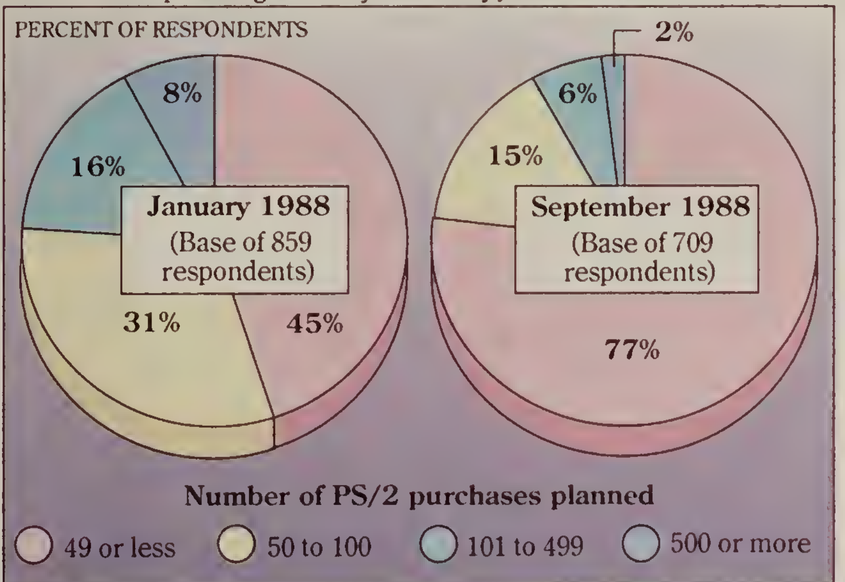
Unlike Microsoft and IBM, these and other users are content with the current Windows. For those who remember CP/M and DOS limits of 64K and 128K bytes from the early 1980s, the 640K-byte barrier does not seem so daunting. Stoddard cited his own firm's use of

Continued on page 48

Inside

- DEC veteran Rose talks PCs. Page 43.
- The French and pig software. Page 43.
- Samna Plus IV allows multitasking. Page 49.

Data View



Dampened demand for PS/2

Among 2,148 MIS execs surveyed, fewer were planning IBM PS/2 purchases recently than at the start of the year, and those who were planning said they would buy fewer machines

SOURCE: THE SIERRA GROUP, INC.
CW CHART

AST, Dell in 25-MHz 386 race at Comdex

BY JULIE PITTA
CW STAFF

LAS VEGAS — Faster and sleeker personal computers based on Intel Corp.'s 80386 microprocessor abounded at the recent Comdex/Fall '88 show. Keeping in mind the motto "Smaller is better," systems vendors launched a number of portable PCs.

PC vendors are scrambling to keep up with the pace set by Compaq Computer Corp., considered the leader in 386 technology. Earlier this year, Compaq introduced a 386 PC running at a clock speed of 25 MHz and a system based on Intel's 80386SX chip set. The 386SX allows a 32-bit microprocessor with a 16-bit external data bus and is expected to allow system designers to build the cheapest 386s yet available.

AST Research, Inc. unveiled a line of 386s running at a clock speed of 25 MHz. Called the Premium 386/25 line, the PCs come standard with 2M bytes of random-access memory, seven expansion slots and a 5¼-in., 1.2M-byte flexible disk drive.

The line features a high-

Continued on page 47

If you answer Yes to two of these questions,

*A*re you developing mainframe COBOL, CICS or IMS applications?

*I*s your development environment sometimes counterproductive?

*W*ould you like to continue to program and test when the mainframe is down, slow, restricted or sixty miles away?

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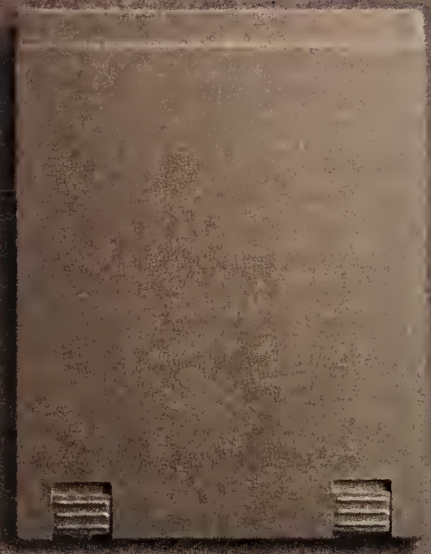
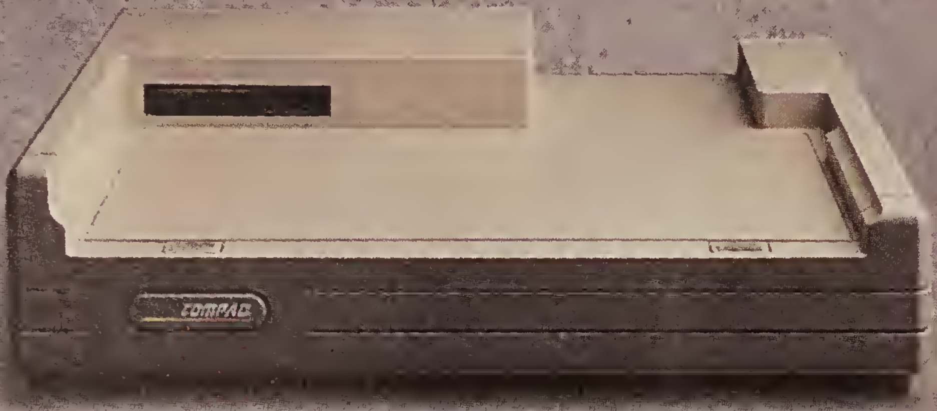
The COMPAQ SLT/286 is the first laptop from the company that set the standard in portable personal computing.

A 3½" 1.44-MB diskette drive is standard.

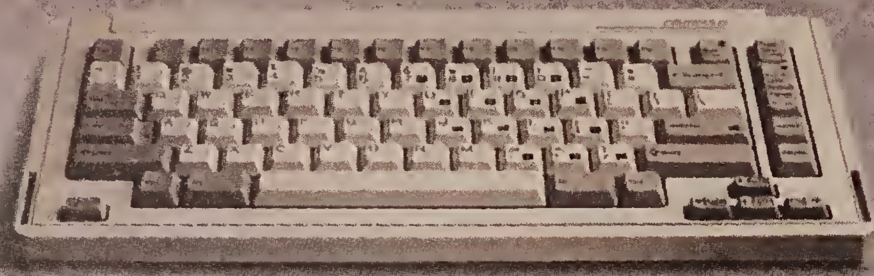
If numbers are your life, an optional numeric keypad is a simple addition.



New battery technology delivers the power to run all these components for over three hours.



An optional Desktop Expansion Base gives you two expansion slots.



A removable keyboard gives your fingers full-size keys, with standard spacing.

An optional internal 2400-baud modem is available.

Weighing in at 14 lb. with a space-saving footprint, the COMPAQ SLT/286 gives you more PC in less space.

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SMALL TALK

Douglas Barney

And the wait goes on . . .

Twenty-three things to do while waiting for your software to ship. Thank goodness that a couple of products, like Dbase IV and the Presentation Manager, have made it off the vaporware list. Although many argue that these two aren't quite finished, at least we can look at them. But many products, like SQL Server and 1-2-3 Release 3.0, remain both unfinished and unshipped. And there's a bus from Extended Industry Standard Architecture that is also of a highly vaporous nature. It is going to be a long, boring wait for all the vapor to dissipate.

Rather than just twiddling your thumbs — they'd be pretty sore by the time this stuff is delivered — there are other, more constructive ways to pass the time. Here are 23:

1. Watch General Noriega's face clear up.
2. Call customer support, ask really dumb questions and refuse to hang up.
3. Cheer the Boston Red Sox on to victory in the World Series.
4. Elect a Democrat president.
5. Marvel as real estate brokers and car salesmen develop integrity.
6. Grow or shrink six inches.
7. Find a cure for the common cold.
8. Make retirement plans, no matter what age you happen to be.
9. Train to be an astronaut.
10. Go to night school and get a Ph.D.
11. Alter the course of world history.
12. Define the meaning of life.
13. Index, then destroy, all articles on unshipped products.
14. Learn to skate for when hell freezes over.
15. Applaud Arab-Israeli reconciliation.
16. Watch Bill Gates go bald.
17. Enjoy Lucille Ball's triumphant return to prime-time television.
18. Discover that Bill Lowe lost his job at IBM — in the year 2010.
19. See IBM's Micro Channel Architecture exploited in interesting ways.
20. Attend a wedding where Joan Collins marries someone her own age.
21. Put up Elvis in your guest room.

Continued on page 47

Back to the future with DEC's PC market

IN PERSON

Digital Equipment Corp. officials like to discuss their progress in personal computer integration, but not their attempts to break into the PC marketplace. John Rose, group manager for PCs at DEC, is no exception. Rose is a 12-year DEC veteran who previously worked eight years at IBM.

Although DEC has suffered in its attempts to enter the PC business — it has produced three failures this decade: the Robin, the Rainbow and the Professional series — Rose says DEC's PC history really started when it began connecting IBM Personal Computers to the VAX.

In an interview with *Computerworld* senior writer William Brandel, Rose looks forward to DEC's PC future.

How do you look back at DEC's personal computing record?

We've essentially been in the PC business for two years, beginning back in September 1986. We've provided products and achieved a lot of MS-DOS success in bringing local-area networks and wide-area networks to integrate desktop devices to VAXs. We've also brought service to the networking business communications, as well as desktop devices.

DEC has struck business agreements with Apple, Compaq, Olivetti and now Tandy to integrate PCs into the VAX environment. Do you intend to strike any sort of agreement with IBM?

I don't foresee any relationship with IBM. Since 1986, we've supported the IBM family of PCs on the desk top.

John Rose *is optimistic about DEC's PC future*

DEC is now perceived as trying to take away market share from IBM, especially at Fortune 1,000 sites. The Micro Channel Architecture products have fared well in these sites. Don't you want a slice of that market?

We want to integrate MCA products in both LANs and WANs. There are certainly far more AT-class devices out there.

Will DEC embrace MCA as a standard?

We announced our support for EISA and think that is the right approach, to evolve the existing [AT] standard. The jury is still out on MCA. A lot of customers are unhappy and have complained of technical problems. We are going to give it time and then evaluate the market. But now we see no substantial presence of Micro Channel devices.

What percentage or how many of DEC's customers want Extended Industry Standard Architecture products?

We have no concrete numbers.

Will drastic changes have to be made to the Tandy-built PCs before DEC introduces them?

I would say there would have to be little more than slight modifications. Some deviation from the present product.

DEC and Tandy will inevitably fight over the same desk tops. How will you manage that scenario?

Continued on page 47

Pigs d'amour: Finding the perfect match

BY WILLIAM BRANDEL
CW STAFF

France's charming cities and its romantic atmosphere are known for being on the leading edge of affairs of the heart. But the country is almost equally devoted to its pork business.

So it was only natural that a French software company produce a swine-tracking application to help pork farmers mate their prized animals.

The product, called Logiporc, is sold by Agrilog. It is a swine management system that is somewhat similar to computerized dating services used in the U.S. Logiporc is currently being used extensively in France, England and Canada and is expected to soon make its debut in the U.S.

Sow suitor

The Logiporc product has helped G. M. Tetreault Nutrition, based in Secesaire, Que., cut costs and raise profit margins by effectively tracking the most attractive suitor for its sows, said Dominique Vignola, a programmer for the company. G. M. Tetreault has been using the product since June, and Vignola said it has helped the company compete in a hotly contested market.

Pork farming and breeding is serious business; the investment in the piggery, the facilities used to raise the animals and the feed and care for the creatures is quite extensive. To cut breeding risks, leading swine producers now invest in genetic tracking of the hogs and match the attributes of their sows against computerized listings of other animals' genes to determine that the offspring will offset the investment.

Agrilog's Logiporc *finds the right match*

"The investment is quite extreme," a Logiporc spokeswoman said. "Because of the financial implications, swine producers are much more aware of the breeding aspects than other farm animal producers.

Another feature of this industry is that because of its required investment, most farms are very large for economies of scale. These dynamics make tracking the animals by hand virtually impossible and increase the need for computerized tracking.

Four modules

The Logiporc product, which caters to these conditions, consists of four linked modules: one for physical recording and monitoring of the breeding herd, two for financial management and one for genetic management. Any information entered in one module is accessible to the others.

The physical monitoring consists of lists for prospective gilts (young sows yet to produce their first litter) to be observed. Other lists in the module track sows to be vaccinated, due to farrow and then to wean. If the genetic attributes of the candidates match up agreeably, the pigs are then brought together for servicing.

The physical module also provides statistical information and a wide range of analyses comparing results of the events as well as the conditions in which the pigs will live.

The financial management modules record stock sales, feed purchases and other matters related to cost. The other financial module tracks price per weight, mortality rate, gross margin and seven-month production forecasts.

It may be a long way from trysts in the shadow of the Arc de Triomphe, but the latest in computerized farm animal dating will help North American pig farmers to bring home more bacon.

SOFT TIPS

Making Dataease-ier

Dataease, from Dataease Corp., is a popular package among many large corporations. Unfortunately, Dataease does not directly export to Ashton-Tate Corp.'s Dbase III Plus, which can be a problem for some mixed shops.

There is a solution. The Dataease files must be exported to a variable-length text file with a .TXT extension. The separator should be a comma. These text files are then imported through Dbase III Plus using the Append From command, type Delimited With comma (,). Now you are set.

Information provided by Corporate Software, Inc., a Westwood, Mass.-based software reseller.

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separately), you get a complete development, test, and distribution environment for both stand-alone and multiuser applications. In addition to the complete dBASE IV software, the Developer's Edition includes special tools such as the Professional Compiler,™ as well as utilities, programming documentation, and a royalty-free, application distribution module.

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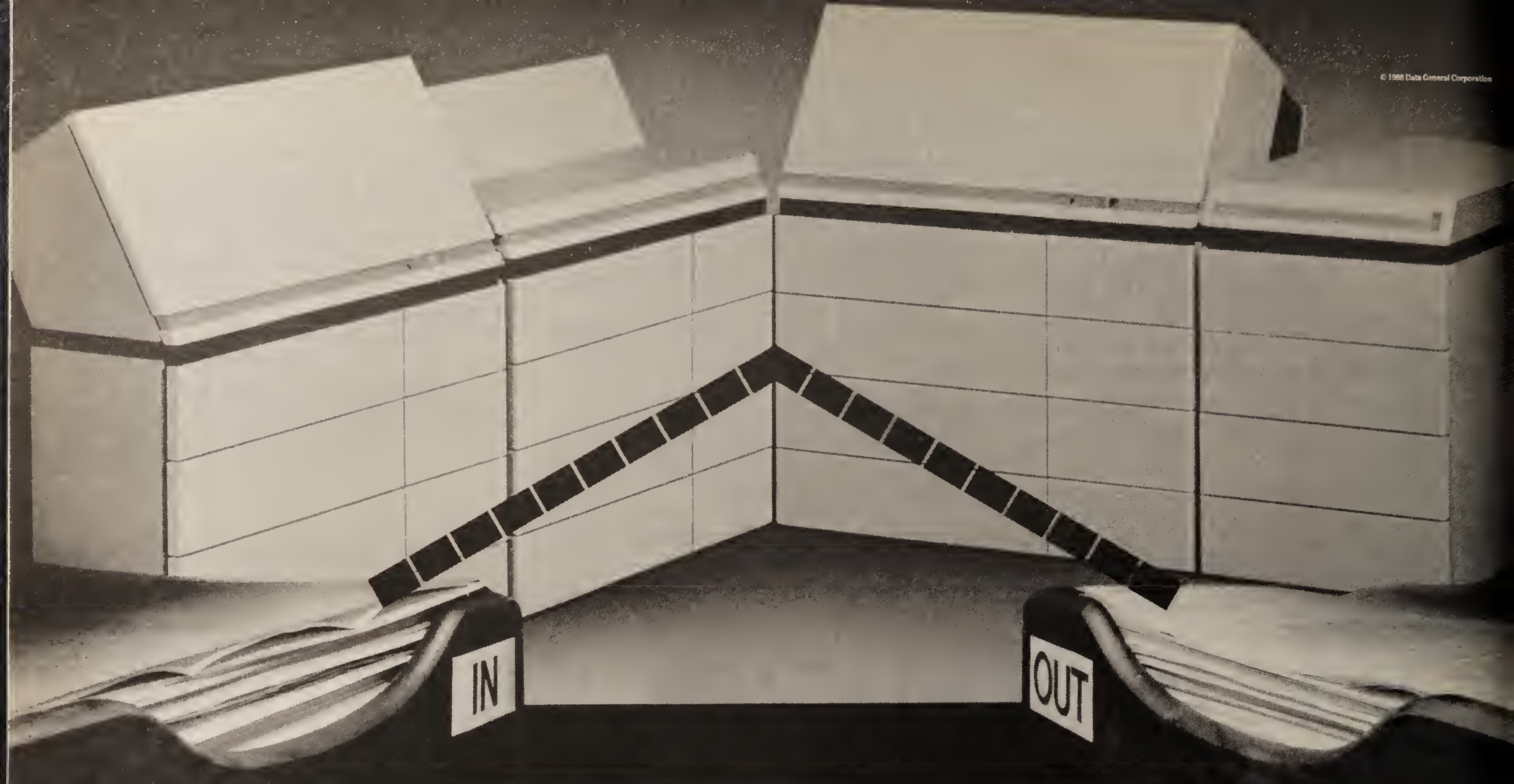

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Barney

FROM PAGE 43

22. Water-ski where the polar ice caps used to be.
23. Find a new vendor.

The transformation of Mom. My mother hated computers. While the rest of us would sit around the dinner table harping about the latest computer this or that, Mom would look down her nose at us. "But Ma," I'd say. "You write for a living. It's *so* much easier to type it with a computer." And, like a typical male executive, she'd say, "That's why I have a secretary."

In fact, Mom, fearing she'd end up a coffee-toting secretary, refused to learn to type. To her, PCs were overly complex typewriters. So she continued to write things out longhand, make corrections and then have her secretary type it out.

With the help of Apple, Mom changed. To save money and gain flexibility, her organization bought a Macintosh and entered the world of desktop publishing. Unlike the IBM PC, which stares at the user with the arcane and frightening A>, the Macintosh literally smiles. And even though her fingers did not exactly dance over the keyboard at first, they *did* crank out some very fine paragraphs.

Something else happened. Once the paragraphs were written, she still saw room for improvement. That's the beauty of a computer. You can massage the text until it is just right — without cutting up pages with scissors and using paste to patch them back together.

Nowadays, Mom fights with her secretary for use of the Mac, and she badly wants another. She may not be a whiz at Lotus 1-2-3, but at the dinner table, we can count on her to fill us in on the latest in font and graphics technology.

The real deal. Ever wonder why so many Lotus execs left all at once? It took them two years to figure out how to print their resumes using Manuscript.

Barney is a *Computerworld* senior editor, microcomputing.

DEC

FROM PAGE 43

Our strategy is to integrate all the possible desktop environments. There is still friendly competitiveness for open desk tops that haven't an intelligent device on them.

For customers who want a DOS-oriented shop, we'll offer a DOS device. For instance, when our 3-MIPS device goes against their 3-MIPS device, you have to look past the architecture and performance.

Our PC Lanserver, when running a number of PCs, uses only 1 MIPS, handles 30 PCs and uses only 20% of complete capacity.

What opportunities are there for DEC in going after PC customers?
There are millions and millions of open desk tops. First there are the ones that haven't been populated by a PC, and then there are ones with the older technology on them.

386 race

FROM PAGE 39

speed cache memory architecture based on Intel's 82385 controller and 32K bytes of cache memory. According to AST officials, it allows data to be accessed quickly by storing frequently used data in zero-wait state cache memory rather than system memory.

Prices for the systems range from $6,595 for an entry-level configuration to $11,795 for the high-end model with a 320M-byte hard disk drive. Two intermediate versions are also available. All configurations are available.

SX appeal
AST also introduced a PC based on the 386SX. Called the Premium Workstation/386SX, the micro runs at 16 MHz and offers six expansion slots as well as AST's high-speed cache memory architecture. It provides 1M byte of RAM, and, like all PCs based on the 386SX, it can run all 80386-based software — but at a slower rate than a standard 386 because of the 16-bit external data bus.

Five configurations are available. They range in price from $3,195 to $5,195 and are scheduled for availability in March.

Dell Computer Corp. also introduced a 25-MHz 386-based machine. Called the Dell System 325, the PC comes standard with between 1M to 4M bytes of RAM, an 82385 cache memory controller with 32M bytes of high-speed static RAM cache and eight expansion slots.

The prices for the systems range from $6,999 with an IBM Video Graphics Array (VGA) monochrome monitor, a 150M-byte hard disk drive and 1M byte of RAM to $11,399 for a system with a VGA color monitor, a 322M-byte hard drive and 4M bytes of RAM. The system is scheduled to ship in December.

Other companies joining AST and Dell in introducing 25-MHz 386-based PCs were Kaypro Corp., based in Solano Beach, Calif., and Compuadd Corp. in Austin, Texas. Pricing on the Kaypro system was not available. An entry-level configuration of the Compuadd 386/25 with 1M byte of RAM is priced at $2,895 and is currently available.

> PC VENDORS are scrambling to keep up with the pace set by Compaq, which is considered the leader in 386 technology.

Tatung Company of America, Inc. in Long Beach, Calif., introduced a tower version of the 25-MHz 386. The Tatung 8600 features 1M byte of RAM and eight expansion slots. The price of an entry-level version is $4,195; the system is currently available.

NCR Corp. introduced a PC based on the 80386SX. The PC916SX runs at a clock speed of 16 MHz and provides 1M byte of RAM and six expansion slots. It ranges in price from $5,195 with a 44M-byte hard drive to $6,595 with a 115M-byte hard drive. Availability of the systems is scheduled for January.

NEC Information Systems, Inc. introduced the Powermate SX, also based on the 386SX chip. It runs at 16 MHz and offers 2M bytes of RAM and a 42M-byte hard drive. It is priced at $4,495 and is currently available.

NCR also unveiled a portable PC based on the 386SX as well as an 80286-based portable. The Powermate Portable SX runs at 16 MHz and offers 2M bytes of RAM and a 42M-byte hard drive. It is priced at $6,595 and is currently available. The Powermate Portable runs at 10 MHz, includes a 20M-byte hard drive and is priced at $3,996. It is also currently available.

Kaypro rings in
Kaypro bolstered its PC offerings with a laptop system. Based on a 12-MHz 80286, the Kaypro 2020 offers 1M byte of RAM, a 20M-byte hard drive and a built-in modem. It weighs 16 pounds and is battery operated. The price of the system was unavailable.

Mitsubishi Electronics America, Inc. in Torrance, Calif., also unveiled a laptop featuring a 12-MHz 286, 640K bytes of RAM and the choice of a 20M- or 40M-byte hard drive. It weighs 14.6 pounds and is AC-powered. A dual-floppy configuration is priced at $3,195, while a model with a 40M-byte hard drive is priced at $5,395.

Micro Express in Santa Ana, Calif., introduced two portable PCs based on a 20-MHz 386. Both portables offer 1M byte of RAM, a 40M-byte hard drive and a weight of about 20 pounds. The Roadrunner Plus with an LCD is priced at $3,399 while the Regal II with a gas plasma display is priced at $3,999.

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Windows

CONTINUED FROM PAGE 39

Windows without the Presentation Manager as proof. Analysts and traders making huge real-time buy/sell decisions get expensive Sun Microsystems, Inc. workstations and OS/2 with Presentation Manager, but they are the exception.

The hoi polloi at Fidelity may have several applications running simultaneously on a PC, even with the 640K-byte limit. This includes host links, two-way data transfers between various networked computers and on-line portfolio analysis with the customer on the phone.

"We have no doubt that there is enough multitasking and enough speed and performance," Stoddard said. He added that Windows is such a step up from single-tasking systems that many users need nothing beyond it.

On hold

Likewise, at Manufacturers Hanover, Block reported that his users may eventually experience greater efficiencies through OS/2 with the Presentation Manager's improved multitasking with multithreading but that there is no immediate need for those capabilities. Price is not a major concern at the bank, he added, and most PCs are 386-based with 4M- or 8M-byte random-access memory.

Block said his users' real concern is solutions. As he put it, "You go to the hospital not for a shot or an operation; you go for a cure." Even with the 640K-byte limit, Windows without the Presentation Manager provides that already, he added.

Less sanguine but still content is a computer vendor developing a system without the Presentation Manager. In Minneapolis, Control Data Corp. had to decide whether to slow the release of its Amigas II meteorological imaging system to accommodate OS/2. Development manager Judy LaFlare said, "Windows has the functionality that we need now."

CDC's decision was to stick with Unix for the high-end graphics workstation and look to non-Presentation Manager Windows for the PC front end of the Amigas system. "We have not looked at Presentation Manager in detail because we are under time and resource pressures," LaFlare said. "We are still writing to Windows."

For those looking to OS/2 eventually, the mechanics of the more complicated system seem of little concern. Users said they expect peripheral and hardware vendors to handle the trickiest portion: writing the additional drivers to handle OS/2 interfacing with Presentation Manager.

Stoddard noted that Fidelity will have to integrate the sundry IBM 3270 screens it has developed and used companywide over the years. He is already seeking major gateway vendors to supply some help. He said that the market immaturity is evident in that only small vendors have attacked this problem so far.

Ball is a free-lance writer based in Boston.

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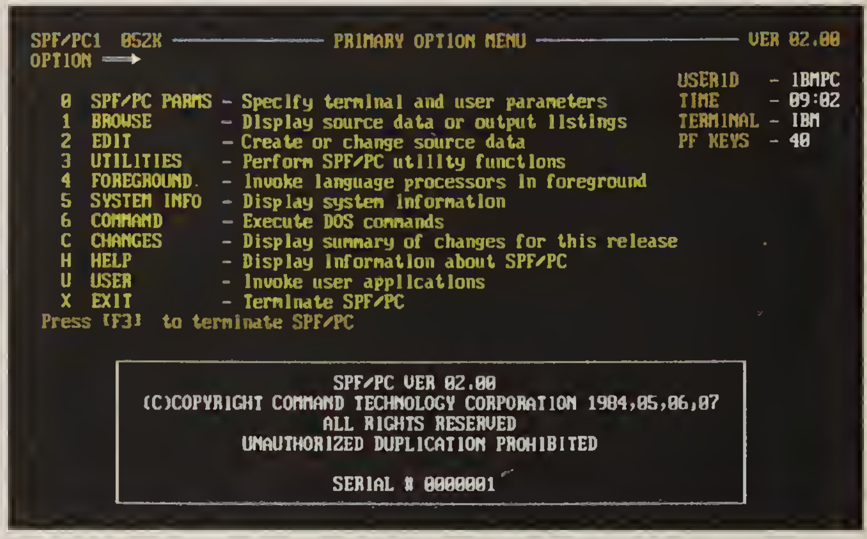

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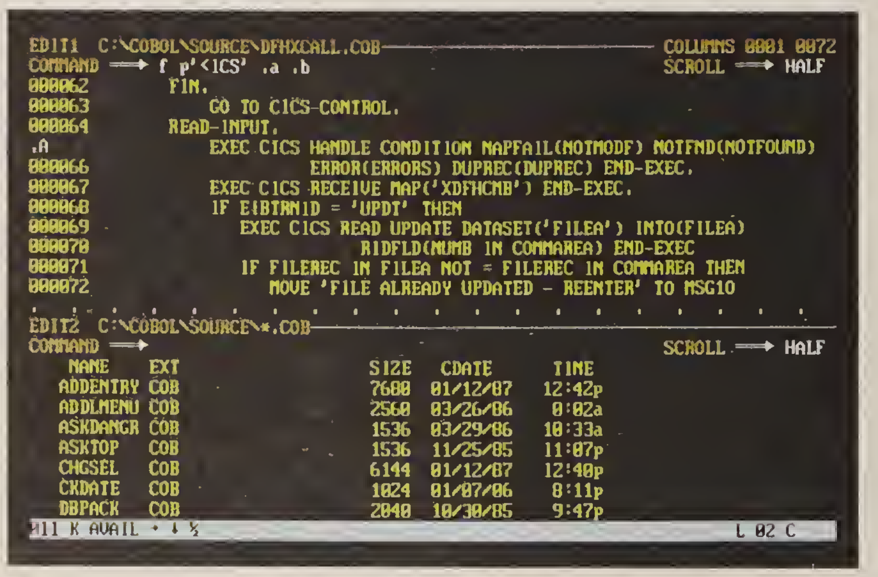
SPF/PC1  052K ─────────── PRIMARY OPTION MENU ─────────────── VER 02.00
OPTION ──►
                                                          USERID   - IBMPC
   0  SPF/PC PARMS - Specify terminal and user parameters  TIME     - 09:02
   1  BROWSE       - Display source data or output listings TERMINAL - IBM
   2  EDIT         - Create or change source data          PF KEYS  - 40
   3  UTILITIES    - Perform SPF/PC utility functions
   4  FOREGROUND.  - Invoke language processors in foreground
   5  SYSTEM INFO  - Display system information
   6  COMMAND      - Execute DOS commands
   C  CHANGES      - Display summary of changes for this release
   H  HELP         - Display information about SPF/PC
   U  USER         - Invoke user applications
   X  EXIT         - Terminate SPF/PC
 Press [F3]  to terminate SPF/PC

            SPF/PC VER 02.00
  (C)COPYRIGHT COMMAND TECHNOLOGY CORPORATION 1984,05,06,07
            ALL RIGHTS RESERVED
       UNAUTHORIZED DUPLICATION PROHIBITED

            SERIAL # 0000001
```

SPF/PC's main menu provides access to the EDIT and BROWSE facilities; utilities for file MOVE, COPY, RENAME, etc.; facilities to access other programs; on-line HELP and more.



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EDIT1  C:\COBOL\SOURCE\DFHXCALL.COB──────────────────── COLUMNS 0001 0072
COMMAND ══► f p'<ICS' .a .b                              SCROLL ══► HALF
000062        FIN.
000063            GO TO CICS-CONTROL.
000064        READ-INPUT.
.A                EXEC CICS HANDLE CONDITION MAPFAIL(NOTMODF) NOTFND(NOTFOUND)
000066                      ERROR(ERRORS) DUPREC(DUPREC) END-EXEC.
000067            EXEC CICS RECEIVE MAP('XDFHCMB') END-EXEC.
000068            IF EIBTRNID = 'UPDT'  THEN
000069               EXEC CICS READ UPDATE DATASET('FILEA') INTO(FILEA)
000070                         RIDFLD(NUMB IN COMMAREA) END-EXEC
000071               IF FILEREC IN FILEA NOT = FILEREC IN COMMAREA THEN
000072                  MOVE 'FILE ALREADY UPDATED - REENTER' TO MSG10
 .  . . .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
EDIT2  C:\COBOL\SOURCE\*.COB─────────────────────────────────────────────
COMMAND ══►                                              SCROLL ══► HALF
   NAME     EXT                SIZE   CDATE     TIME
  ADDENTRY COB                 7680  01/12/87  12:42p
  ADDLMENU COB                 2560  03/26/86   0:02a
  ASKDANGR COB                 1536  03/29/86  10:33a
  ASKTOP   COB                 1536  11/25/85  11:07p
  CHGSEL   COB                 6144  01/12/87  12:40p
  CKDATE   COB                 1024  01/07/06   8:11p
  DBPACK   COB                 2040  10/30/85   9:47p
411 K AVAIL • ↓ ½                                             L 02 C
```

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Alexander

CONTINUED FROM PAGE 39

plied. You and the networking people have been telling everybody that it's the Year of the LAN for more than six years already. You ought to be happy you finally got it right, I told him.

Don't you see, he responded, PC networks lead to downsizing — not only the downsizing of minis and mainframes to micros, but also downsizing of the data center. When that happens, you can kiss the MIS people goodbye, he said.

He figures MIS will never even know what hit it. The typical IS manager, when he's not trying to stem the flow of PCs into his company, is hunkered down in the basement with the mainframe. Meanwhile, end users are running wild upstairs, buying PCs, hooking them up, all the while taking over the DP turf.

There will come a day that end users will take trips to the basement, like tourists, to take a look at the dusty, decrepit mainframe that will be down there. It will be just like going to Stonehenge, the analyst said.

We're talking mythology here, I replied. You want myth, I'll give you myth. How about the myth of the sophisticated end user? Do you think most end users really know what they're doing? These are the people who think they can do all their work in whatever was the last application they learned, I said.

IS will still be around no matter what happens, if for no other reason than to make sure that end users don't hang themselves on all the wiring they will be laying to hook up with each other, I explained. MIS types will also have to make sure that end users don't part too foolishly with their money, no matter how cheap PCs become.

But the most important job MIS will have will be building the platforms on which PC networks will be based and making sure the architecture is appropriate for the structure, I said. Hey, you have to know the rest of the place stands on the basement; take out the foundation and the whole joint will collapse.

Well, it's something to think about, the analyst said. I'll tell you what. I'll walk around the block a few times and give it some thought.

He strolled off, just as another analyst turned the corner. This one wanted to tell me about the implications of end users writing their own applications on PCs.

Alexander is a *Computerworld* senior editor, microcomputing.

NEW PRODUCTS

Software applications packages

Samna Corp. has announced **Version 1.2** of **Samna Plus IV**, its word processing system.

Version 1.2 will now run under the SCO Xenix operating system from The Santa Cruz Operation to enable multitasking and multiuser applications.

The package reportedly integrates word processing with desktop publishing features and spreadsheet capabilities. The Xenix version of Samna IV is available in single or multiuser versions for Intel Corp. 80386-based processors running SCO Xenix System V 2.2.1.

Prices range from $695 to $1,295, depending on system and configuration.

Samna, 5600 Glenridge Drive, Atlanta, Ga. 30342. 404-851-0007.

Zsoft Corp. has upgraded **Publisher's Type Foundry**, its Microsoft Corp. Windows application software package for electronic publishing.

Version 1.1 includes a Windows screen font translator and incorporates a new virtual memory manager designed to facilitate the handling of large, complex documents with no degradation in performance.

The product's laser printer translators now include full support for the Hewlett-Packard Co. Laserjet II. A DOS program is included for downloading fonts to HP printers without the use of Windows.

Publisher's Type Foundry Version 1.1 costs $495. Current users may obtain the upgrade at no charge, the vendor said.

Zsoft, Suite 100, 450 Franklin Road, Marietta, Ga. 30067. 404-428-0008.

A file-encryption program that runs in both Microsoft Corp. MS-DOS and IBM and Microsoft OS/2 protected-mode operating environments has been announced by **Wisdom Software, Inc.**

Called **File Encrypt**, the package is reported to be a full software implementation of the Data Encryption Standard algorithm and is written entirely in assembly language. The program is available in either a 3½-in. or 5¼-in. format.

File Encrypt costs $69.95.

Wisdom, P.O. Box 460310, San Francisco, Calif. 94146. 415-566-0754.

Good Software Corp. has introduced 17 real estate software programs, including applications for property management, investment analysis, lease analysis and property appraisal, the vendor said.

The series reportedly meets the standards of the property management arm of the National Association of Realtors, as well as the Commercial Investment Real Estate Council. Target groups include individual investors, syndicators and real estate brokers.

Prices range from $195 to $795.

Good Software, Suite 500W, 13601 Preston Road, Dallas, Texas 75240. 214-239-6085.

A package that exports map graphics to a desktop publishing environment has been announced by **Mapping Information Systems, Inc.**

Called **Mapinfo**, the software runs on IBM Personal Computers and compatible systems and will export graphics information in the Computer Graphics Metafile (CGM) format to a variety of desktop publishing products supporting the CGM standard, the vendor said. These products include Xerox Corp's. Ventura Publisher and Pagemaker from Aldus Corp.

Mapinfo is also reportedly compatible with most commercially available database software. The product requires 640K bytes of random-access memory and DOS 2.0 or higher.

Mapinfo costs $750, and digitized maps are available separately for between $95 and $2,000, depending on the scope and type of each map.

Mapping Information Systems, Hendrick Hudson Building, 200 Broadway, Troy, N.Y. 12180. 800-327-8627.

Fleming Software has released **Version 2.0** of **Procast**, its business forecasting package for IBM Personal Computers and compatible systems.

Program enhancements include both automatic and what-you-see-is-what-you-get forecasting. Several diagnostic tools are incorporated into the product, including trend and seasonal analysis, multiple regression and exponential smoothing.

The program reportedly is in color on color monitors and offers support for IBM's Enhanced Graphics Adapter graphics. A math coprocessor is recommended.

Procast is priced at $295.

Fleming Software, P.O. Box 528, Oakton, Va. 22124. 703-591-6451.

Pulse Research has enhanced its equation application processor package for the IBM Personal Computer and compatible systems. **Equator** was designed for entering and evaluating symbolic equations in scientific and engineering environments.

Version 4.0 reportedly allows users to enter equations from the keyboard, evaluate them and send the results to a data file. New features include complex number support and Greek characters, and results can be graphed on either the screen or a plotter, the company said.

The program provides online, context-sensitive Help and is compatible with Hewlett-Packard Co.'s 7470 plotter, the HP Laserjet printer and equivalent IBM graphics printers.

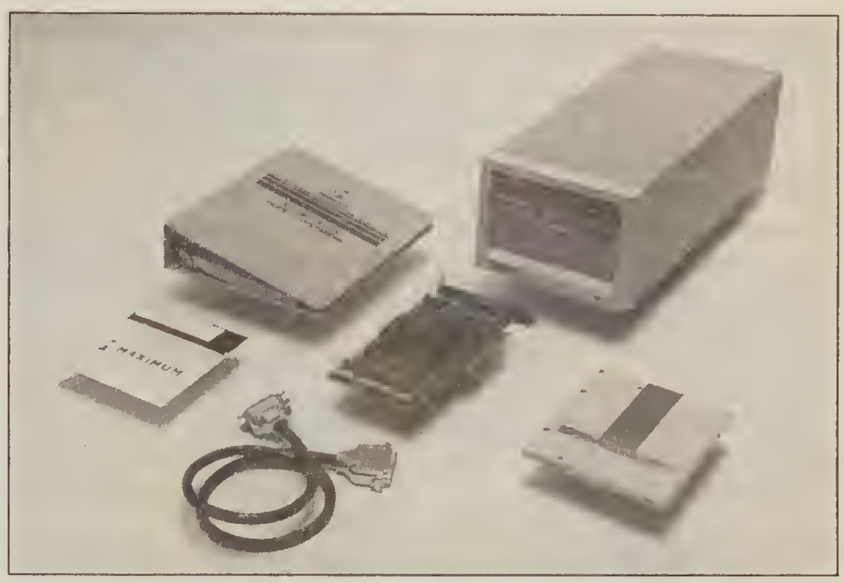
Equator 4.0 costs $59.

Pulse Research, P.O. Box 696, Shelburne, Vt. 05482. 802-985-2928.

Cosmic, a software development arm of the National Aeronautics and Space Administration, has introduced two analysis packages for aeronautics and related industries. Both programs run on IBM Personal Computers and compatible systems.

Windy was designed to aid a given community in choosing a site for a wind turbine machine. The software reportedly predicts the broadband noise generated by interactions between the turbulent boundary layers on the blade surfaces with their trailing edges. Machine size, power output and distance to the receiver can also be factored. Windy is written in Basic, costs $200 and carries inventory number LAR-13984.

Opti is an optical communication link analysis program that was developed at the Jet Propulsion Laboratory to analyze optical and near-infrared communication links that use pulse position modulation and direct detection. The user can reportedly alter output parameters to achieve a desired link margin. Opti is written in Fortran 77. The program, including source code, costs $300.



Maximum Storage's *APX-4000 subsystem*

Cosmic, The University of Georgia, 382 E. Broad St., Athens, Ga. 30602. 404-542-3265.

Landcadd, Inc., a developer of software for land-planning professionals, has announced a contour-mapping and terrain-modeling program for use within Autodesk, Inc.'s Autocad software.

Called **Quadrangle**, the product works in conjuction with Autocad 2.6 or higher and generates three-dimensional contour maps, grid maps and triangulated terrain models. Features reportedly include smoothing, labeling, indexing, grid-mesh views from arbitrary viewpoints and hidden-line removal.

Quadrangle costs $595.

Landcadd, 7519 E. Highway 86, Franktown, Colo. 80116. 303-688-8160.

Data storage

Maximum Storage, Inc. has upgraded its **APX-4000** write-once optical disk subsystem by increasing its storage capacity from 500M to 800M bytes, according to the vendor.

The 5¼-in. unit is available in both internal and external mount versions and costs $4,250 and $4,450, respectively.

Maximum Storage, 5025 Centennial Blvd., Colorado Springs, Colo. 80919. 719-531-6888.

Northeast Digital Corp. has released a small computer systems interface (SCSI) for its **2000 series RAM Disk Subsystem**.

According to the company, the 2000 series conforms to ANSI standard X3T9.2 SCSI protocols and has a maximum random-access memory capacity of 320M bytes. Optional tape or optical disk are available.

Pricing starts at $4,700 for an 8M-byte RAM Disk.

Northeast Digital, 124 Railroad Drive, Ivyland, Pa. 18974. 215-322-7742.

A plug-in, solid-state board that can emulate a Winchester hard disk has been announced by **Tex-**

Continued on page 50

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transmission reliability
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See us on page 51

Continued from page 49

as Microsystems, Inc.

Designed for use in the IBM Personal Computer XT, PC AT and compatible computers, the **SSD** is a battery-backed memory board that plugs directly into a bus connector and requires only one slot, the vendor said. The device is available with either 2.5M or 5M bytes of memory and is priced from $2,995.

Texas Microsystems, 10618 Rockley Road, Houston, Texas 77099. 800-627-8700.

Peripherals

Kurta Corp. has introduced a programmable **16-button cursor** for use in large-scale drawing and digitizing applications.

The product works in conjunction with the company's IS/Three input systems for architectural engineering and mechanical design environments. The cursor's 16 buttons can be programmed to execute frequently used software commands, and all buttons provide positive tactile feedback to the user to indicate command execution.

The Kurta 16-button cursor with 10-ft cord costs $395.

Kurta, P.O. Box 60250, Phoenix, Ariz. 85082. 602-276-5533.

Citizen America Corp. has announced price reductions on two of the company's nine-wire dot matrix printers.

The **120D** prints at 120 char./sec. in draft-quality mode and 25 char./sec. in correspondence-quality mode. The price has been dropped from $269 to $199.

The **180D** printer offers draft-quality speeds of 180 char./sec. and a correspondence-quality speed of 29 char./sec. Previously offered at $299, the unit is now available for $249. Both printers were introduced to the market last year.

Citizen America, Suite 190, 2401 Colorado Ave., Santa Monica, Calif. 213-453-0614.

Infoscribe, Inc. has expanded its line of rugged, industrial-grade dot matrix printers with the addition of the **Model 8400 Turbo-Speed** demand-document printer.

The product operates at speeds over 400 char./sec. and produces an average throughput of approximately 320 char./sec., the vendor said. The printer sports all-steel construction and is ideally suited for printing invoices, purchase orders, tickets, labels, checks and bonds in either single-layer or multipart forms. Emulations reportedly include IBM and Epson America, Inc.

The Model 8400 costs $2,195.

Infoscribe, 1808 Michael Faraday Court, Reston, Va. 22090. 703-689-2805.

Qume Corp. has introduced the **Crystalprint Publisher**, an Adobe Systems, Inc. Postscript-compatible page printer that incorporates a reduced instruction set computing printer controller and a Weitek Corp. Hyperscript-Processor XL-2000 chip set.

The printer comes standard with 3M bytes of random-access memory and offers a 300 by 300 dot/in. resolution. It is compatible with Apple Computer, Inc. Macintosh and Apple IIGS computers via the Appletalk interface and can also be linked to Microsoft Corp.'s MS-DOS and IBM and Microsoft's OS/2 systems through standard serial or Genicom Corp. Centronics parallel interfaces.

The Crystalprint Publisher costs $4,499.

Qume, 500 Yosemite Drive, Milpitas, Calif. 95035. 408-942-4000.

Qume's ***Crystalprint Publisher***

MSC Technologies, Inc. has introduced the **PC Mouse II** high-end optical input device. The two-button device reportedly features Ultra-Res 2000, which allows users to determine how fast they want the mouse to move the screen cursor.

Ultra-Res 2000 is a built-in accelerator that allows users to achieve variable resolution from 20 to 2000 count/in. with a choice of nine different speed settings. The product operates with the industry-standard Microsoft Corp. mouse protocol and carries a lifetime warranty, the vendor said.

PC Mouse II costs $149.

MSC Technologies, 47505 Seabridge Drive, Fremont, Calif. 94538. 415-656-1117.

A self-contained copying machine for floppy disks is available from **Dragoon Corp.** Called **Copybox**, the device reportedly takes unformatted blank disks and then formats, sectors, copies and verifies data from a data or systems disk without tying up a computer.

The unit accommodates both 3½- and 5¼-in. disks for use with IBM, Apple Computer, Inc., NEC Information Systems, Inc. and Atari Corp.systems.

Copybox costs $899.

Dragoon, Unit F, 1270 Avenida Acaso, Camarillo, Calif. 93101. 805-987-4911.

Kurta Corp. has enhanced its cordless cursor and pen device. Users can now manipulate screen cursors and pull-down menus and can quickly input computer commands, the vendor said.

Designed specifically for use with the company's Is/One intelligent graphics tablet, the **four-button cursor** carries a suggested retail price of $150.

Kurta, 3007 E. Chambers St., Phoenix, Ariz. 85040. 602-276-5533.

Revolution Software, Inc. is now shipping **VGA Dimmer**, a programmable screen dimmer that offers compatibility with IBM Video Graphics Array, Enhanced Graphics Adapter and other video standards.

In addition to the video hardware, the product requires an IBM Personal Computer XT, PC AT, Personal System/2 or compatible system. VGA Dimmer consumes less than 3K bytes of random-access memory and costs $29.95.

Revolution Software, 4 Century Drive, Parsippany, N.J. 07054. 201-455-0995.

Hewlett-Packard Co. has expanded its family of drafting plotters with the addition of the E-size **HP Draftpro EXL** and the D-size **HP Draftpro DXL.**

The devices are targeted at the personal computer computer-aided design market and run with IBM Personal Computers and compatibles, the HP Vectra PC and Apple Computer, Inc. Macintosh computers, the vendor said.

The HP Draftpro EXL costs less than $6,500. The HP Draftpro DXL is priced under $500.

HP, 3000 Hanover St., Palo Alto, Calif. 94304. 415-857-1501.

Varityper, Inc. has announced two laser image-setters that reportedly offer Adobe Systems, Inc. Postscript capabilities.

The **4200P** produces 1,200 dot/in. images at 15 in./min; the **4300P** offers a resolution of 2,400 dot/in. at 10 in./min, the vendor said.

Both devices can be driven by a variety of Postscript applications running on the Apple Computer, Inc. and IBM platforms, as well as the company's Epics composition system.

Varityper, 11 Mt. Pleasant Ave., East Hanover, N.J. 07936. 201-887-8000.

Hewlett-Packard Co. has expanded its Laserjet printer family with the addition of the **HP Laserjet IID** printer.

The latest model reportedly complements the Laserjet Series II printer by providing twice the paper capacity (400 sheets), two paper trays, two-sided printing and an accessory for automatically printing up to 50 envelopes.

Each HP Laserjet IID device comes with 24 fonts and costs $4,295.

HP, 3000 Hanover St., Palo Alto, Calif. 94304. 415-857-1501.

Pentax Teknologies Corp. is now marketing its **SB-A4301** image scanner directly to end users.

The 300 dot/in., flat-bed scanner is being sold as part of a desktop publishing package, which reportedly includes the scanner, a parallel interface for IBM-compatible microcomputers and software for programming and operating the scanner from the host computer. The scanner requires an IBM Personal Computer with 640K bytes of random-access memory and a hard disk.

The SB-A4301, with interface card and bundled software, costs $2,195.

Pentax, 880 Interlocken Pkwy., Broomfield, Colo. 80020. 303-460-1600.

Mannesmann Tally Corp. has introduced a six page/min laser printer.

The **MT905** is reportedly compatible with the Hewlett-Packard Co. Laserjet II series and comes standard with a 250-sheet single-input cassette. It costs $1,995.

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value around."

See us on page 51

The company also announced a dot matrix printer targeted at the low-end market. The **MT81** is for use with a single-station personal computer and is said to provide a bidirectional draft-quality printing speed of 130 char./sec. The device costs $199.

Mannesmann Tally, 8301 S. 180th St., Kent, Wash. 98032. 800-843-1347.

Board-level devices

Computer Peripherals, Inc. has extended its High Fidelity line of add-in products for IBM Personal Computers and compatibles with the addition of the **CPI-XMA** memory expansion board.

The full-length circuit board is available in 2M- and 4M-byte versions that cost $2,495 and $3,995, respectively, according to the vendor.

Computer Peripherals, 667 Rancho Conjeho Blvd., Newbury Park, Calif. 91320. 805-499-5751.

Control Systems, Inc. has introduced a high-resolution graphics controller for the IBM Personal System/2 Micro Channel bus.

The **Artist Designer 16 MC** reportedly offers a resolution of 1,664 by 1,200 pixels for monochrome applications and is ideal for computer-aided design, manufacturing and engineering environments, the vendor said.

The board can accommodate four shades of gray in a two bit/pixel operating mode and is offered at $3,995.

Control Systems, 2675 Patton Road, St. Paul, Minn. 55113. 612-631-7800.

A memory board designed to utilize IBM Micro Channel Architecture has been announced by **Capital Equipment Corp.**

The 4M-byte **OS/RAM4** is said to incorporate a custom very large-scale integration chip and will automatically configure itself to DOS, IBM and Microsoft Corp.'s OS/2 or Unix operating environments, the vendor said. The product is backed by a two-year warranty on parts and labor.

OS/RAM4 costs $395.

Capital Equipment, No. 107, 99 S. Bedford St., Burlington, Mass. 01803. 617-273-1818.

An expansion board for IBM Personal Computer ATs and compatible systems has been announced by **Boca Research, Inc.**

The product is available in two configurations: The **IOAT41** includes one 25-pin parallel port and one 9-pin serial port and costs $119; the **IOAT42** ships with an additional 25-pin serial port and is priced at $129.

Boca Research, 6401 Congress Ave., Boca Raton, Fla. 33487. 407-997-6227.

DTK Computer, Inc. has expanded its product line with the addition of two motherboards.

The **PEM-2000** is an IBM Personal Computer AT-compatible, Intel Corp. 80386, 20-MHz board that reportedly comes standard with two serial ports and one parallel port as well as an Intel 80286-20 microprocessor and a socket for an optional Intel 80387-20 coprocessor. The board offers a base memory of 640K bytes and is priced at $1,795.

The **PEM-2030B** is a small-footprint 383 20-MHz workstation motherboard, the vendor said, and comes standard with a 32-bit memory board, which is expandable to 16M bytes. The board costs $1,695.

DTK Computer, 15711 E. Valley Blvd., City of Industry, Calif. 91744. 818-333-7533.

Micron Technology, Inc. has unveiled several board-level memory products for IBM Personal Computers and compatible computers.

The **Spectrum** and **Spectrum Plus Video Graphics Array** boards and the **Automaster Enhanced Graphic Adapter** were designed to provide more speed and higher resolution for desktop publishing, computer-aided design and financial modeling applications, according to the vendor.

The Spectrum Video Graphics Array reportedly offers 256-color graphics with resolution up to 640 by 480 pixels. It costs $379. The Spectrum Plus Video Graphics Array offers a 1,024- by 768-pixel resolution and is priced at $579. The Automaster Ehanced Graphics Adapter board is available for $249.

Micron Technology, 2805 E. Columbia Road, Boise, Idaho 83706. 208-383-4000.

Ideassociates, Inc. has introduced the **Ideamax 80**, an 8M-byte, 32-bit IBM Micro Channel memory expansion board.

The board is specifically targeted at IBM Personal System/2 Model 70 and 80 users, the vendor said. Both 256K- and 1M-byte chips may be mixed on the same board, and print-spooling features are included with the product.

The Ideamax 80 costs $495 without memory.

Ideassociates, 29 Dunham Road, Billerica, Mass. 01821. 508-663-6878.

Software utilities

A graphing utility for IBM Personal Computers and compatibles has been unveiled by **New England Software, Inc.**

Graph-in-the-Box Analytic reportedly offers 16 types of graphs based on X-Y and double-Y plotting and provides a choice of linear or logarithmic scaling for up to three axes. It costs $199.95.

New England Software, No. 3, Greenwich Office Park Greenwich, Conn. 06831. 203-625-0062.

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(214) 956-7282

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(713) 363-3838

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(800) 762-7782

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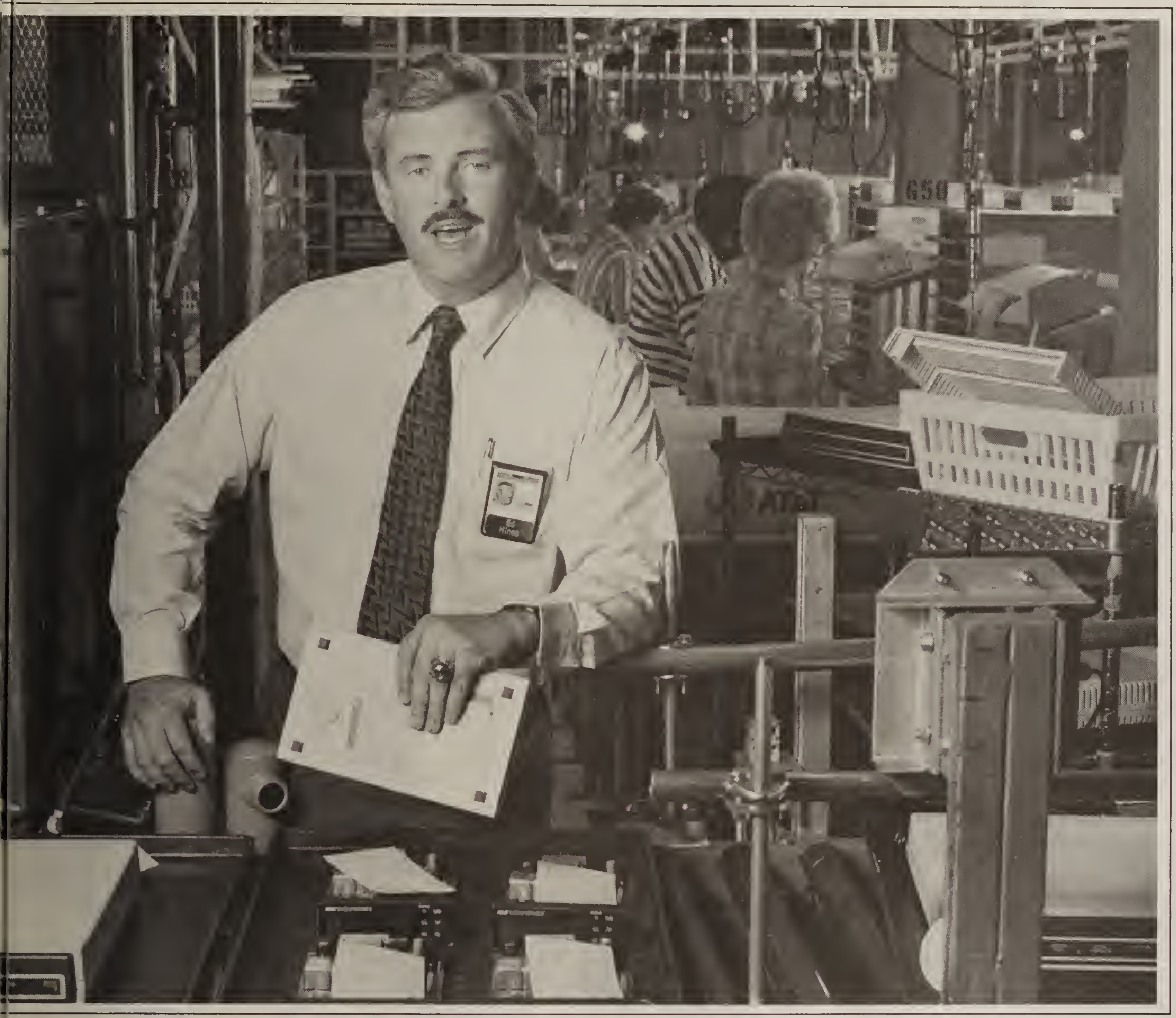

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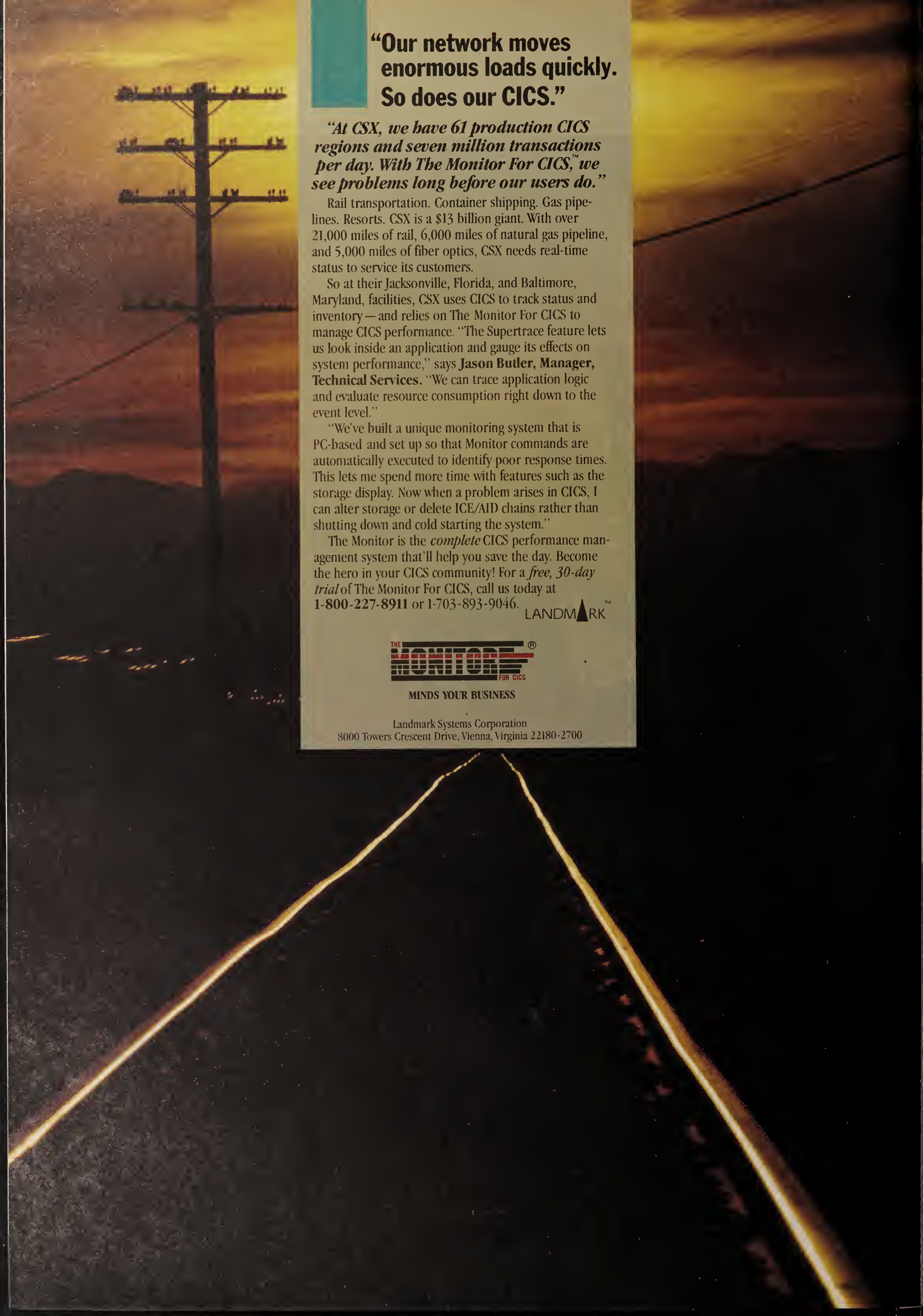

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NETWORKING

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Thomas Nolle

Learn ISDN ramifications

One of the areas that network planners need to look at as they evaluate the future impact of Integrated Services Digital Network (ISDN) is how the evolving standard will change communications hardware such as T1 switches, concentrators and multiplexers.

The lack of information in this area — compared with, say, the extensive publicity given to private branch exchange (PBX) vendors and carriers' ISDN plans — has been frustrating for communications and MIS managers.

ISDN's Primary Rate Interface is quite similar to T1 at the physical level — enough so that many T1 repeater products, and even some T1 multiplexer and cross-connect products, can pass ISDN through transparently. The nodal devices of today could be made compatible with ISDN physical interfaces through the addition of an ISDN channel card, provided that no processing of the ISDN information was required.

It is in the processing that ISDN is different. In today's services, call control and signaling are passed in the user portion of the channel; this is called "in-band signaling." In contrast, ISDN uses "common channel" signaling, which employs a single channel, the D channel, for all call control and signaling

Continued on page 60

Standards selected

Air Force awards TRW, EDS LAN contract

BY MITCH BETTS
CW STAFF

BEDFORD, Mass. — The U.S. Air Force, in its battle against a hodgepodge of incompatible local-area networks, has chosen a set of de facto standards and two vendors that will compete against each other to supply approved LAN products.

The Air Force selected TRW Corp.'s Information Networks Division, based in Torrance, Calif., and Electronic Data Systems Corp. (EDS), in Bethesda, Md., as the prime contractors for what is expected to become the largest LAN contract ever awarded, with an estimated value of $150 million over seven years. The companies will compete to supply Air Force bases with approved products, an Air Force spokesman said.

The philosophy behind the Air Force's Unified LAN Architecture (ULANA) program is simply standardization to promote interoperability, according to David Romanelli, ULANA program manager at the Air Force Electronic Systems Division, located here at the Hanscom Air Force Base.

"The real reason the program got started is the proliferation of nonstandard local-area networks," Romanelli said. Consequently, the ULANA specification calls for products conforming to IEEE 802.3-standard Ethernet, Transmission Control Protocol/Internet Protocol and IBM's Netbios interface for LAN applications.

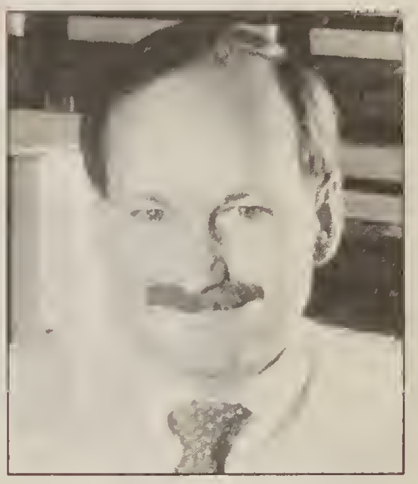
After developing the architecture with assistance from Mitre Corp., a government contractor based here, the Air Force awarded the contract to EDS and TRW in October. The vendors will deliver and install LAN

Continued on page 60

Ungermann savors impact of merger with Tandem

IN PERSON

Breaking 10 months of silence, Ralph Ungermann, president and a cofounder of general-purpose network supplier Ungermann-Bass, Inc., is still savoring his honeymoon with merger partner Tandem Computers, Inc. It has been a little rougher in the Manufacturing Automation Protocol (MAP) market, but Ungermann is prepared to stand his ground. He spoke recently with *Computerworld* Senior Editor Patricia Keefe about customer demands and industry standards.



Ralph Ungermann

How is UB helping Tandem compete with IBM?

You have to realize that the customer is making a fairly simple decision: whether to be open or safe. Yes, IBM is a safe decision, but it locks you into lots and lots of issues. Ungermann-Bass has the ability to come in with a safe but open decision.

"Open" is a pretty hypey term.

Yeah, we all use the word "open." Maybe we've got to coin a new word. Another word I use is "free." What customers

Continued on page 58

AT&T cuts Accunet prices, buys Harris VSATs

BY ELISABETH HORWITT
CW STAFF

Two recent moves by AT&T were aimed at expanding the carrier's dominance in the long-distance market on two fronts. First, AT&T announced price decreases of 25% or more for its Accunet T1.5 Service, a dedicated digital service supporting rates of up to 1.5M bit/sec. Second, AT&T agreed to purchase Harris Corp.'s line of very small-aperture terminal (VSAT) satellite dishes.

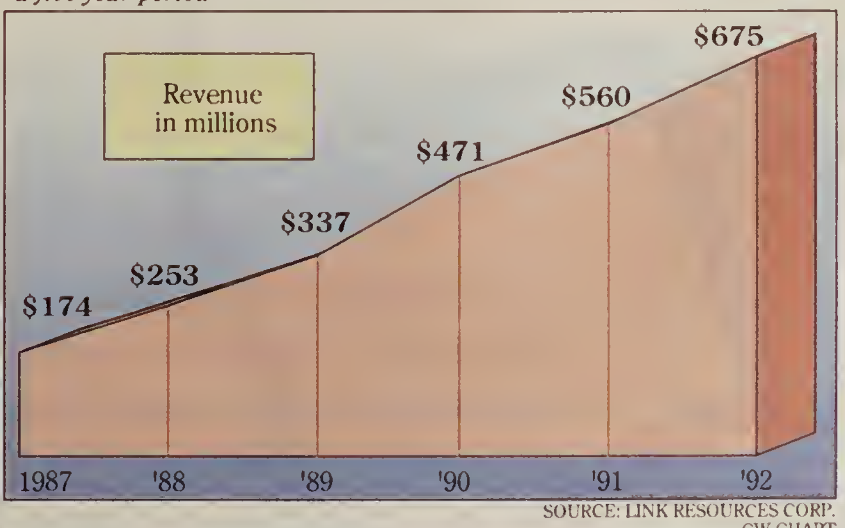
According to the Accunet rate revisions, which are scheduled to become effective Dec. 24, customers who order service on a monthly basis will pay a fixed charge of $1,800, down from $2,600, and $12 per mile for intercity channels, down from $15.50. This represents a 25% decrease for a typical 300-mile-long circuit. Volume pricing plans offer even larger cuts, the vendor said.

Long-distance carrier U.S. Sprint Communications Co. indi-

Continued on page 60

VSAT network market projection

Sales for hardware and services are slated to grow almost 300% during a five-year period



SOURCE: LINK RESOURCES CORP.
CW CHART

Inside

- Raycom adds rack-mount system. Page 64.
- Tolerant, CDC roll out gateway system. Page 64.

COMDEX NOTEBOOK

No wait promised on 16M-bit Token-Ring

Would we kid you? There will be no waiting in the 16M bit/sec. checkout line, according to John Budway, IBM's LAN title planning manager. "As far as I know, we're not supply-constrained," he said. "We had planned to introduce this card earlier, but we waited for this show because we wanted to make sure the supply channels were full."

Well chipsters, it turns out IBM is using an internally developed chip for its 16M bit/sec. network. But this will not necessarily leave third-party token-ring makers out in the noncompatible cold.

IBM has an agreement with Texas Instruments, Inc. that allows TI to develop chips compatible with the IBM design. Look for TI's dual 4M/16M bit/sec. chip to appear early next month.

Another piece to IBM's open connectivity strategy? IBM tested its new 16M bit/sec. hardware running under network environments from Novell, Inc., Sun Microsystems, Inc., Apollo Computer, Inc. and Banyan Systems, Inc. The new joint testing program was designed to verify that the 16M bit/sec. card will work in a variety of "leading" hardware and software environments.

Anyone confused? IBM did not announce 16M bit/sec. support for the Systems/36 and 38, nor for the RT. This last one is peculiar, considering that A) IBM has positioned the RT as a technical workstation; and B) it kept emphasizing the use of 16M bit/sec. speed with complex graphics and interactive applications — such as voice and imaging — that are tailor-made for high-powered workstations. Maybe this is IBM's way of saying that the RT is a bust.

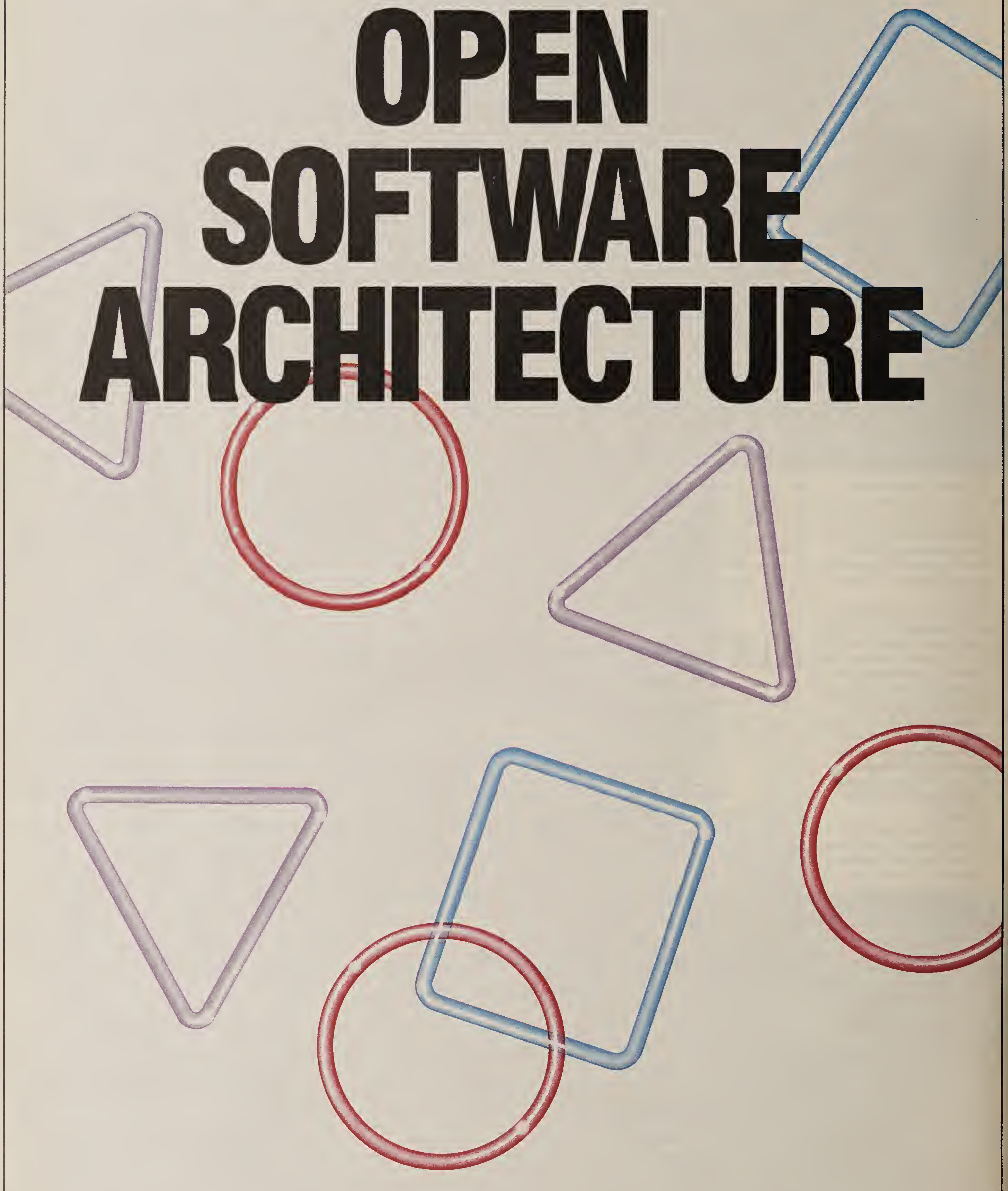
Banyan unveiled a driver that ensures compatibility between IBM's Token-Ring Network 16/4 Adapter and Banyan's Virtual Network Operating Software, or Vines. Look for it in an upcoming release of Vines.

Also embracing 16M bit/sec. is Madge Networks Ltd., which plans to provide 16M bit/sec. products in the spring. "It's possible you could buy one card and get two speeds," said founder Robert Madge. And Proteon, Inc., which unveiled a 16M bit/sec. card for IBM's Micro Channel, is considering versions for IBM's Personal Computer AT bus and the proposed Extended Industry Standard Architecture bus.

Coming down the pipeline: Applications featuring OS/2 LAN Manager Named Pipes support were demonstrated in Microsoft's booth and included packages from MDBS, Inc., Netwise and Consumer Software.

Compiled by Patricia Keefe.

OPEN SOFTWARE ARCHITECTURE



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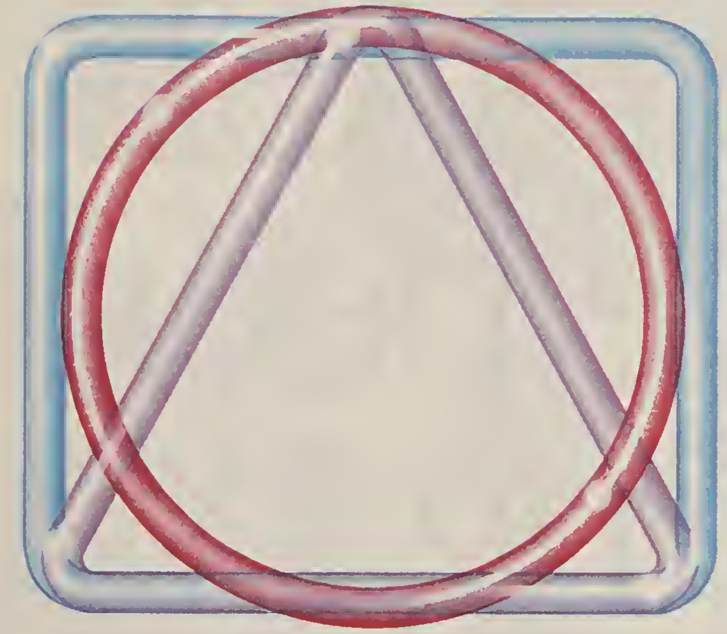

Operators deal with multiple message streams. From multiple vendors. So, shouldn't your automated operations product be like your operator? AutoMate/MVS is.

Many software vendors stress integration to other products they sell. Their automated console products interface with their performance monitors. Or their job schedulers. Or their databases. Sure, AutoMate/MVS also interfaces with other Duquesne Systems' products such as Multi-image Manager, SMR, TPX, DASDMON and NetSpy™.

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Ungermann

CONTINUED FROM PAGE 55

really want is the ability to pick and choose. Many companies are saying that they're open because they'll support [the International Standards Organization] sometime in the future.

That's not really open. The customer wants to know that if he buys IBM, he can easily attach a Mac to it, so that's the fundamental difference. We'll support the major technologies.

But UB just dropped IEEE 802.4 in the factory.

We were one of the pioneers in that market, so we wouldn't have done that if we thought there'd be any negative impact.

> "PEOPLE ARE going ahead with TCP/IP. It is clearly the protocol of choice for the next few years. Customers say they expect a transition within a two- to 10-year time frame."
>
> RALPH UNGERMANN

Surely you've got some unhappy token-bus customers?

I talked to them. Almost all fundamentally agreed that we did the right thing. We have the vast majority of token-bus installations worldwide, and we'll continue to support [them].

I know of no more than two or three customers who planned to upgrade their production environments to MAP 3.0 because of the cost involved. People who installed MAP 2.1 plan to stick with it; it works. The advantage of going to 3.0 for them is very little.

So is the MAP Users Group out of touch with the majority of factory network users?

I can't speak to that. It's true that users on the committee are trying to establish 802.4. But we never push technology. Many customers have decided to install Decnet. They've invested in that media, they believe very much in ISO, and they want to run on top of it. We did what our customers wanted, which means our manufacturing sales will continue to grow.

How will you migrate users to Open Systems Interconnect?

We want to protect customers from that transition as much as possible. We want to make the same [applications programming interfaces] available across different stacks. We'll also offer a protocol bridge between OSI and TCP/IP.

Has OSI pulled the plug on TCP/IP?

No. People are going ahead with TCP/IP. It is clearly the protocol of choice for the next few years. Customers say they expect a transition within a two- to 10-year time frame.

Is Macintosh connectivity an issue?

Yes, and for the range of products — the SE, Plus and the II. They want it direct, the same way they get it for their personal computers, and they want to link Macs into enterprise networks.

Do you detect much interest in OS/2 connectivity?

It's more a function of how fast the industry accepts OS/2. DOS will be here for a very long time. LAN Manager is very high on the vast majority of customers' lists. We just shipped our LAN Manager-based software.

I would say that OS/2 is certainly in the longer term plan, but there's not a huge push on right now because there aren't enough applications. Plus, the cost to go to OS/2 is substantial.

Will OS/2 knock Novell out of the box?

I don't think OS/2 will be the death of Novell by any means. It will co-exist with the LAN Manager, which will be successful. A lot of customers plan on using Novell in the future. Novell is strong. It may be proprietary, but it's a de facto standard. Hundreds of people know how to build products around it, and that's awfully hard to displace.

What hot bandwagons are you hopping on?

We'll line up behind Microsoft's Sybase Server and SQL. Fiber Distributed Data Interface will be the backbone of choice. We'll go, for sure, from 4M Token-Ring and 10M bit/sec. Ethernet speed to 100M bit/sec. The question is, do we also offer 16M bits? The issues are integrating FDDI into the Token-Ring and Ethernet world with the right level of network management.

What exactly are the communications capabilities of the Micro Channel Architecture?

I don't think anyone can explain why you should invest in it, other than that IBM says to. But we do have a very strong demand for MCA products. We're backlogged; we can't build the stuff fast enough. There's a general feeling that IBM is supporting it and will do stuff with it.

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Standards

CONTINUED FROM PAGE 55

servers, bridges, gateways and host computer connections at more than 200 Air Force bases throughout the country.

TRW said it will be offering its own hardware and repackaged OEM products, while EDS will rely primarily on 3Com Corp.'s Bridge Communications, Inc. subsidiary, based in Mountain View, Calif., as the subcontractor for networking products.

By selecting two vendors, the government is ensuring continued price competition, especially since the two contractors are using some of the same suppliers, Romanelli said. For example, both TRW and EDS reportedly will use modems from Chipcom Corp. and encryption gear from Xerox Corp. as well as networking products from Cisco Systems, Inc., Excelan, Inc. and Fibercom, Inc.

Users of ULANA networks will be able to exchange electronic mail and perform file transfers between personal computers and mainframes, as well as connect to the Defense Data Network.

Under the first phase of the contract, the Air Force will conduct standards-conformance and interoperability tests at Gunter Air Force Base in Montgomery, Ala.

"Before we allow users to order any of these components, we need to be sure that there is interoperability between all of the components," Romanelli explained.

After the eight months of testing, the Air Force will draw up a list of approved products, about 60 core products and 140 options. In the contract's delivery phase, users will be able to order products through a central ULANA store at Tinker Air Force Base in Oklahoma City.

Romanelli said that one of the highest volume items will be network cards for personal computers. He estimated 40,000 potential orders for network cards, to be installed in the military's standard Zenith Data Systems Corp. Z-248 micros.

AT&T cuts

CONTINUED FROM PAGE 55

cated that it would introduce similar cuts to stay competitive with AT&T. MCI Communications Corp. is still determining how it will respond, a spokesman said.

AT&T also agreed to purchase Pactnet, Harris' VSAT satellite dish product line. AT&T has been a marketing agent for Pactnet since February 1986 as part of its Skynet Star Network Service.

VSAT dish plans

AT&T plans to sell the VSAT dishes either as adjuncts to its service or as part of a private network that includes dedicated hubs, company spokeswoman Daisy Ottman said. The company bought VSAT-maker Tridom Corp. earlier this year.

AT&T does not see its satellite offering as competing against itself but rather as a way to fill a wider range of customers' communications needs, Ottman said.

The company said it will integrate its VSAT offering with its Accunet terrestrial data services. Through this, Accunet could link a customer's data center in Boston to headquarters in New York, while Pactnet VSATs coupled with the Skynet service could link headquarters to sales or retail outlets throughout the country.

> "THIS IS A good time for AT&T to be purchasing VSATs, since the economics [of the technology] have become clearly demonstrable."
>
> J. MICHEL GUITE
> SALOMON BROTHERS

"This is a good time for AT&T to be purchasing VSATs, since the economics [of the technology] have become clearly demonstrable," commented J. Michel Guite, a vice-president at Salomon Brothers, Inc. While the terrestrial link may be most cost-effective as a pipeline between two major cities, VSATs are often less expensive for remote areas because of their ease of installation and distance-independent cost.

Customers are also looking for a major VSAT vendor they can count on, Guite pointed out. "People are wondering, 'Will Equatorial survive? Will NEC stay committed' " to the satellite market?" he said.

VSAT sales should increase more than 300% by 1992, according to Link Resources Corp. (see chart page 55).

Harris will continue to sell its larger earth stations and retains the right to sell Pactnet to the U.S government and developing countries, according to company spokesman James Murphy. The company sold Pactnet "primarily because we don't sell satellite services, and in the price-sensitive [satellite] communications market, there is little room for acceptable profit margins for nonintegrated suppliers."

Nolle

CONTINUED FROM PAGE 55

tasks. This signaling channel causes problems when ISDN is introduced into traditional nodal switching environments.

The first problem is that signals telling a switching device where to route a channel are no longer an intrinsic part of that channel. That means a networking device cannot pull a 64K bit/sec. channel out of an ISDN Primary Rate Interface pipeline and route it elsewhere — as it can with non-ISDN T1 transmissions — because the signaling data on the D channel would not follow the smaller channel to its destination.

A related difficulty is that it is only possible to forward a D channel signal to another ISDN switch. As a result, companies that want to route individual 64K bit/sec. channels among their different sites must convert to ISDN equipment throughout. Such an all-or-nothing change will not appeal to many users — whether the equipment involved is a networking device or a computer.

The Consultative Committee on International Telephony and Telegraphy addressed this problem for computing equipment by recommending ISDN terminal adapter protocols that would enable IBM Personal Computers, telephones and hosts to communicate with existing non-ISDN equipment. But linking ISDN and non-ISDN network switches is more complex because of the D channel problems discussed above. A PC without an ISDN board can still talk to ISDN devices, but it will not be able to take advantage of sophisticated ISDN features such as voice/data integration.

Some vendors have recognized this and begun to respond. For example, Timeplex's D-Channel Server, demonstrated at the Enterprise Networking Event in Baltimore in June, provides a control interface between the firm's T1 products and ISDN signaling paths.

As technology becomes available to incorporate ISDN in networking devices such as T1 multiplexers, network managers must consider when, how and where it makes sense to convert their networks to the new standard.

Usage-dependent

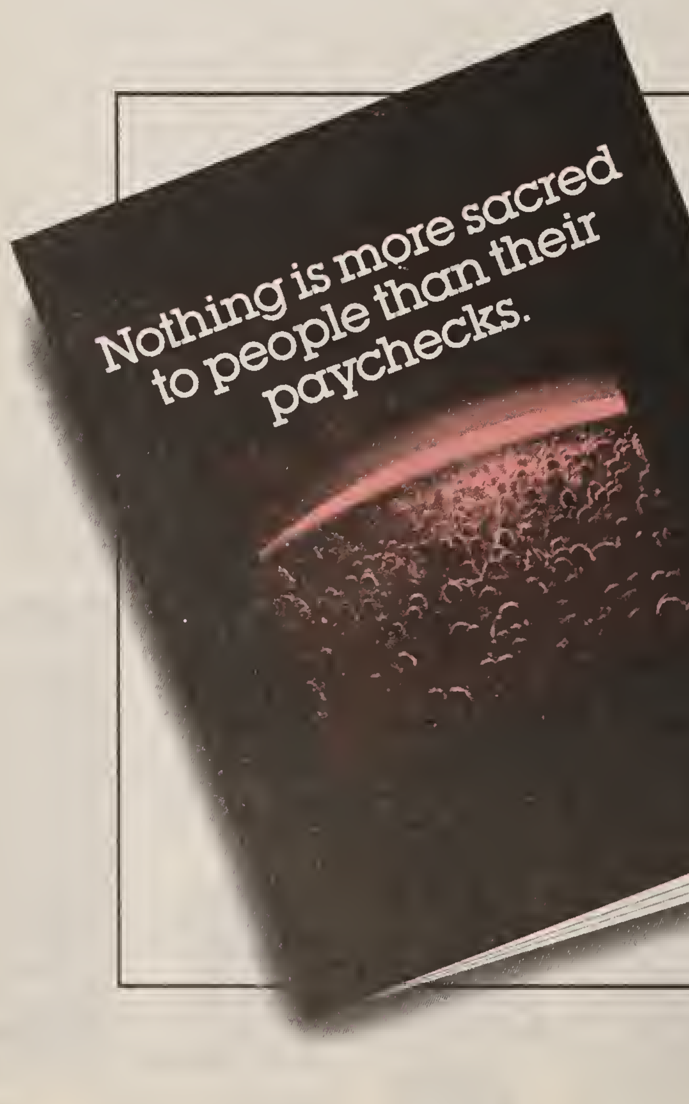
As a digital switched service whose costs depend on usage, ISDN makes sense for multipoint networks that currently run over leased lines. It makes no sense as a substitute for point-to-point leased-line networks or for links that must be permanently on-line in order to guarantee response time.

ISDN will thus tend to change the cost comparisons that have guided network planners in installing network concentration devices such as T1 multiplexers and in using wideband facilities to carry traffic from many sources. An early step will be to revisit the marginally justified portions of the network to determine whether ISDN will make them better candidates for switched service through public facilities.

Data networks will require careful analysis, because ISDN increases the data capacity of a call from an average of between 2,400 and 4.8K bit/sec. to 64K bit/sec. Switched ISDN backup for even wideband leased services will become a practical alternative to today's "reserved" forms of T1 redundancy.

There are few aspects of large-scale private networking that will be unaffected by ISDN. Users who fail to address the issues of the ISDN transition in early procurement and network planning may find their basic nodal network architectures incompatible with ISDN. It is this class of user that risks its current equipment investment — not the user who recognizes early on the need to plan for ISDN transition.

Nolle is president of CIMI Corp., a communications consulting company based in Haddonfield, N.J.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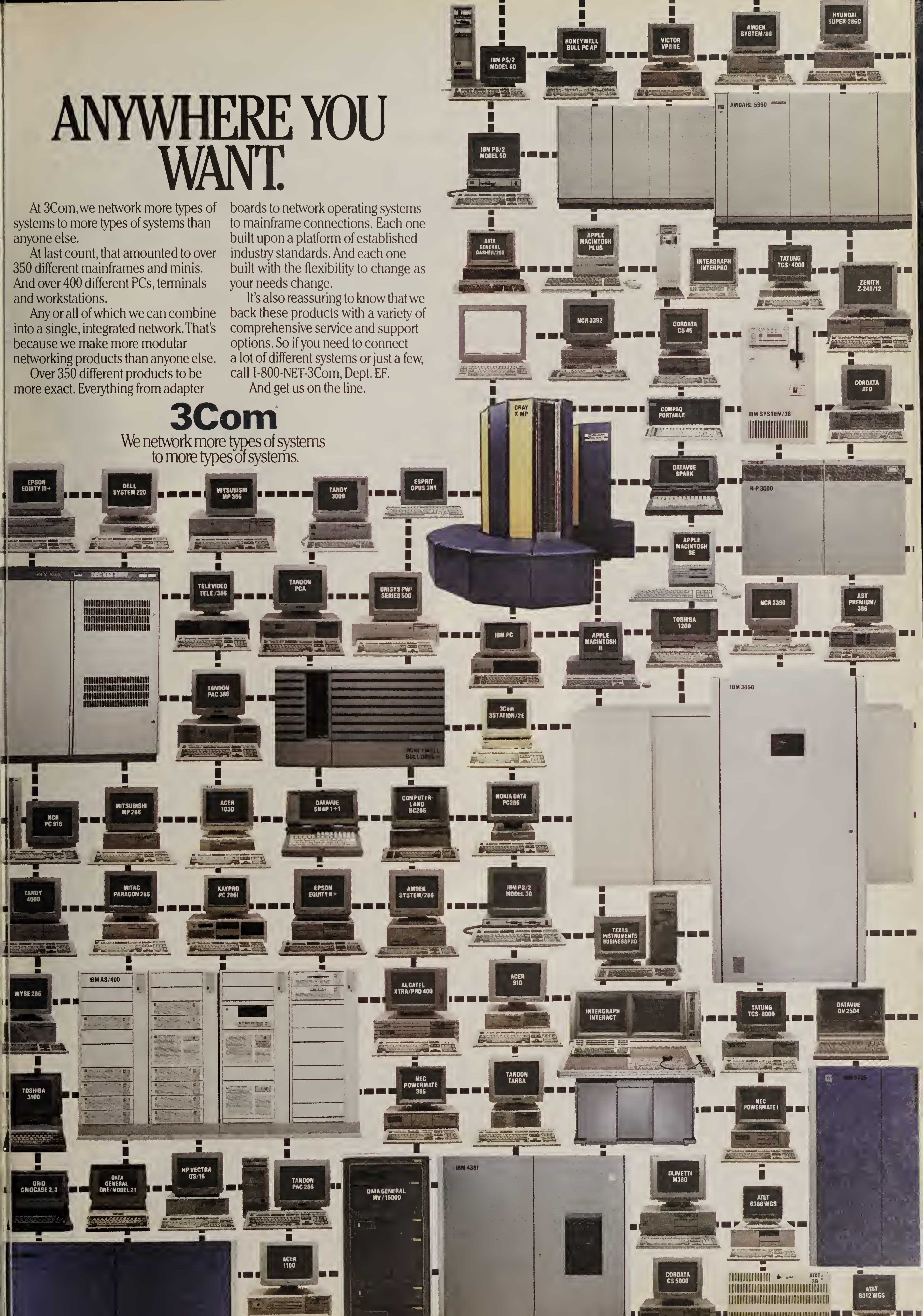

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Peter Hill, Director, Personnel and Systems
Peter Ward, Chief Executive
Geoff Moreton, MRP II Project Leader

NEW PRODUCTS

Local-area networking hardware

Raycom Systems, Inc. has announced its **3400 Series Rack Mount System**.

The rack reportedly handles up to eight Raycom token-ring local-area network fiber-optic extenders. The system can be integrated into a standard 19- or 23-in. rack and has a self-contained 110V power supply.

The 3400 Series Rack Mount System is priced at $550.

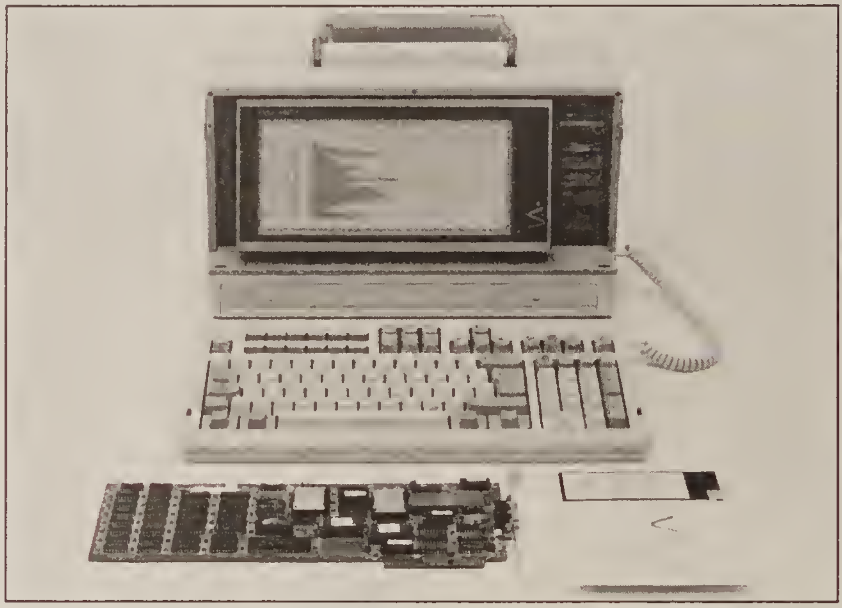
Raycom, 6395 Gunpark Drive, Boulder, Colo. 80301. 303-530-1620.

The **Tops** division of **Sun Microsystems, Inc.** has announced a device that enables Apple Computer, Inc. Macintosh computers and IBM Personal Computers to communicate at 770K bit/sec., the company said. **Flashbox** will reportedly be available in December for $189.

Tops, 2560 9th St., Berkeley, Calif. 94710. 415-549-5900.

Two multitasking Ethernet analyzers have been announced by **Spider Systems, Inc.**

The **Spidermonitor P200** is a self-contained portable analyzer that can be used either in-house or in the field, the vendor said. The **Spidermonitor K150** is a software and add-in board kit that reportedly provides the same capabilities by converting an existing personal computer for use as a network analyzer. Both units perform statistics collection functions as well as network analysis through packet capture and decoding.


Spider Systems' *Spidermonitor P200*

The Spidermonitor P200 costs $11,900. The Spidermonitor K150 software and board kit costs $7,850.

Spider Systems, 12 New England Executive Park, Burlington, Mass. 01803. 800-447-7807.

Links

Tolerant Systems, Inc., in conjunction with **Control Data Corp.**, has announced the immediate availability of the **Gateway Hub** system.

The hardware and software system reportedly provides users with seamless access to dissimilar computer systems through a single, consistent set of user commands. The product is made up of a combination of Tolerant's fault-tolerant hardware, a Unix-based operating system and CDC's Ascent software. The system is said to be capable of supporting more than a thousand users and will prevent data loss in the event of a mechanical failure.

Pricing is dependent on installation requirements.

Tolerant Systems, 81 E. Dagget Drive, San Jose, Calif. 95134. 408-433-5588.

Greene Software has announced a remote communications package for the IBM System/34, 36 and 38 minicomputers as well as the recently announced Application System/400 series.

Designated **S3Xcomm**, the package reportedly allows a remote personal computer to communicate with a host PC connected to the IBM system through a 5250 emulation board with Hayes Microcomputer Products, Inc.-compatible modems. No extra hardware or communications features are required.

According to the vendor, the software provides detailed logging of all calls, automatic receive mode, mouse support and Help screens. The program is written in fast C and assembly language and is available on either 5¼-in. or 3½-in. diskettes.

S3Xcomm costs $149.

Greene, P.O. Box 23, Victor, N.Y. 14564. 716-924-4456.

Avatar Technologies, Inc. has announced the **Macmainframe Programmer's Toolkit**, a full complement of Applications Programming Interface (API) software tools.

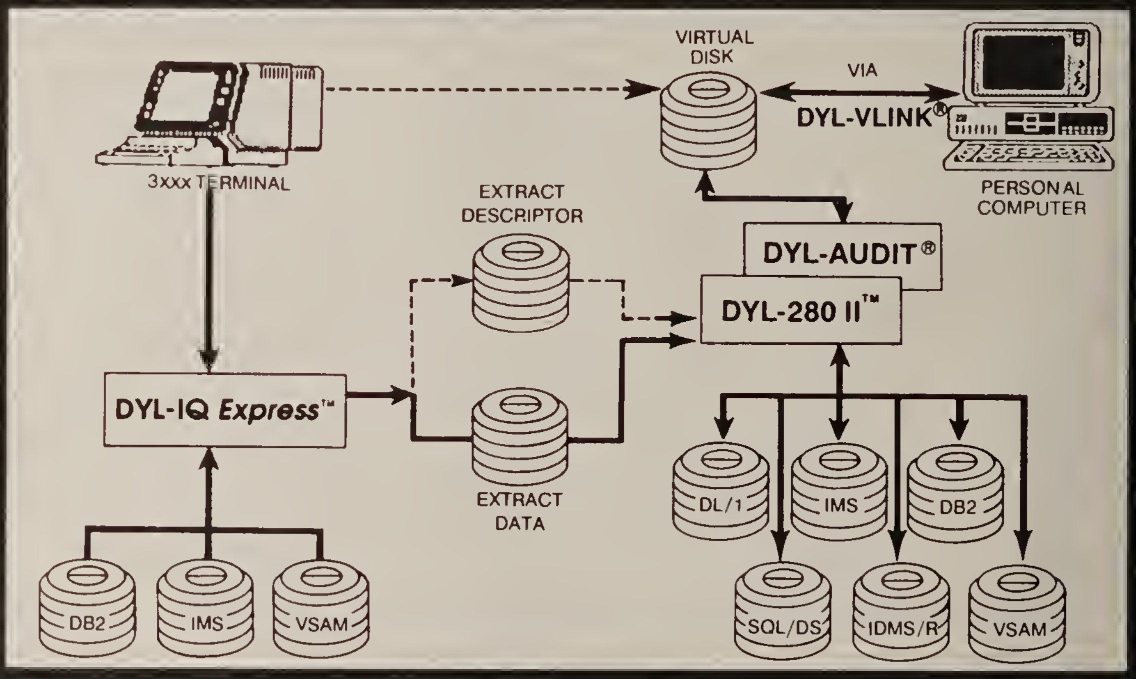
The product is composed of software options designed specifically to work with the company's Macmainframe series of Apple Computer, Inc. Macintosh-to-IBM mainframe 3270 connectivity products.

The tool kit will reportedly provide Macintosh programmers in 3270 environments with a range of API tools to customize user interfaces with host applications.

The Macmainframe Programmer's Toolkit can be obtained at no charge and will be available as an option to the Macmainframe series and as an independent software package. Deliveries are scheduled to begin in the fourth quarter.

The company has also announced that Macmainframe

Continued on page 66



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	Relative Price	Overall Compat-ibility	Vendor Support	Overall Score
1. Dell Computer: 386/16 (PC's Limited)	86	86	83	84
2. Compaq Deskpro 386 Model 40	59	89	73	81
3. Zenith Model Z-386	81	84	73	79
4. IBM PS/2 Model 80	60	78	76	78
5. WYSEpc 386 Model 3216	81	80	77	78

PC WEEK POLL: 286 PCs

	Relative Price	Overall Compat-ibility	Vendor Support	Overall Score
1. Dell System 200	87	87	86	83
2. AST Premium/286	76	89	76	80
3. Compaq Deskpro 286	58	90	73	78
4. Zenith Model Z-286	81	83	74	78
5. IBM PS/2 Model 50	58	81	73	75

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AD CODE NO. 11H04

Continued from page 64

3270, its terminal emulation software that is used for Macmainframe SE and Macmainframe II, is now available for Macmainframe DX. This addition reportedly allows the entire Macmainframe series to use common Macintosh software.

The Macmainframe DX software upgrade kit includes read-only memory, software and a user's manual and will cost $100.

Avatar, 99 South St., Hopkinton, Mass. 01748. 617-435-6872.

Access Technology, Inc. has announced the **20/20 Word Processing Connection** for Digital Equipment Corp.'s line of VAX computers.

The product is said to provide a seamless bridge between Access' 20/20 and several leading word processing programs used on DEC VAX machines — specifically Microsystems Engineering Corp.'s Mass-11, Wordperfect Corp.'s Wordperfect, Marc Software International's Wordmarc and WPS-Plus (DX format), offered by DEC.

Pricing for the 20/20 Word Processing Connection ranges from $600 for the Microvax 2000 to $11,500 for the VAX 8978. Multiple machine and corporate licensing programs are also offered.

Access, 6 Pleasant St., S. Natick, Mass. 01760. 508-655-9191.

An Ethernet repeater that is available in both local and remote configurations is now being offered by **Fibermux Corp.**

The **FX701-L** local repeater reportedly links two remote segments of a local-area network via standard AUI cable. It may be equipped with both thick and thin Ethernet interfaces on both sides, and a single FX701-L can reportedly connect two segments up to 100m apart.

The **FX701-R** remote fiber-optic repeater was designed specifically for distances greater than 100 m, the vendor said, and when used in pairs is capable of linking two remote segments up to 2,800 m apart.

Both repeaters are available in a card-only version for use in the company's FX201 12-slot chassis. Pricing ranges from $1,250 to $3,400.

Fibermux, 9428 Eton Ave., Chatsworth, Calif. 91311. 818-709-6000.

Modems/Multiplexers

Three automated facsimile/modem switches designed to eliminate costly line charges for both facsimile machines and personal computers have been introduced by **High-Tech Resources, Inc.**

The **Model V/F/M Fax/Modem Switch** allows a fax or modem to share a voice line with exclusion that prevents barge-in, the vendor said. Features include a 24-hour automatic answer facility with preset rings. The **Model F/M/A Switch** was designed for exclusion and key system bypass and can also be used with answering machines. The **Model M/F** is for use with two devices on a single dedicated phone line and will reportedly decipher the incoming tones to connect the appropriate receiving device.

The Switch models are priced from $100 to $350.

High-Tech Resources, No. 102, 4225 W. Glendale, Phoenix, Ariz. 85051. 800-422-2832.

Two error-correcting internal modems for the IBM Personal System/2 and IBM standard bus products have been announced by **Ventel, Inc.**

Both units operate at 300, 1,200 and 2,400 bit/sec. and include error-checking capabilities. The **24/2E Internal Modem** was designed for the IBM PS/2 Models 50, 60 and 80 and is said to be fully compatible with the Micro Channel and OS/2. The **PC Modem 2400E** runs in IBM Personal Computers, PC XTs and ATs and compatible machines and can be used with all AT-compatible computers running OS/2 software, the vendor said.

Both modems are priced at $549, which includes a five-year warranty.

Ventel, 2121 Zanker Road, San Jose, Calif. 95131. 408-436-7451.

A family of multifunction modems has been announced by **Data Race.**

According to the vendor, the **Mastermodem** series can support Group III facsimile exchanges and IBM terminal emulation for 5250 and 3270 mainframe sessions. The Mastermodem series also reportedly provides on-line interaction with most minicomputers at speeds of 9.6K bit/sec.

The product also performs batch file transfers at 19.2K bit/sec. Some functions require optional software support, the company said.

The Mastermodem personal computer internal modem card is available at a cost of $995, and the Mastermodem external package has a price tag of $1,345.

Data Race, Suite 108, 12758 Cimarron Path, San Antonio, Texas 78249. 512-692-7632.

Emulex Corp. has announced a 16-line communications multiplexer that was designed for Digital Equipment Corp.'s Microvax 3500 and 3600 series of computers.

Designated the **QS09**, the micro-based board can be configured from a 96K bit/sec. terminal attached to any one of the 16 ports without removing the board or powering down the system, according to the company.

The QS09 is priced at $2,000. Optional one-to-four cable kits are available at a cost of $200.

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EXECUTIVE REPORT

MIS IN RETAILING

Store systems help retailers give shoppers what they want

BY KATHY CHIN LEONG

A throng of giggling kids circles an IBM Personal System/2 Model 30 in the children's department of the Dayton-Hudson Corp. clothing store in Burnsville, Minn. One boy, his grimy fingers clasping the joystick, is caught up in the action of the Jeans Game, a video game in which the object is to navigate a character through a series of obstacles to ultimately buy a pair of Levi Strauss & Co. 501 jeans.

As far as the children are concerned, they are simply being entertained by a computer game, replete with sound and color animation. They are actually being exposed to a sales tool that promotes the store's line of Levi clothing.

During the past two months, Levi has disseminated game-equipped computers to nine participating stores in various parts of the country. The reports have not yet been written on the success of this technology pilot, but Jeff Harlow, director of retail marketing at Levi Strauss in San Francisco, says he thinks it is a winner.

Levi Strauss' strategy of "visual merchandising" represents just one of many nontraditional methods that retailers, assisted by their MIS departments, are using to vie for consumer dollars. Across the country, retail MIS executives, under pressure to boost profits and cut costs, are getting more involved than ever before with the business of attracting and holding customers.

In large part, this new involvement results from the fact that retailing is going through a bad case of financial doldrums.

In 1987, the retail industry, including general merchandise, hard goods and catalog enterprises, garnered $164.7 billion in revenue.

In 1988, that figure is expected to increase by only 5.5%, according to the Washington, D.C.-based National Retail Merchants Association (NRMA).

CHRIS DEMAREST

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Retailers, facing the hard reality that they are competing in a nearly stagnant market, are putting their faith in information systems. It is not that the technologies have changed all that much. Although some are trying out innovations such as videodisks, satellite networks and electronic data interchange (EDI), there has not been much new under the sun since the advent of the Uniform Product Code.

What is changing, however, is how retailers are thinking about applying known technology. Cultivation of customer loyalty has risen to the top of their priority lists, and retailers have assigned much of the responsibility for associated tasks, such as improving customer service and accumulating information for targeted marketing, to MIS.

"I am absolutely convinced that we [MIS professionals] play a big part in improving customer service," says Ronald Ackerman, senior vice-president of systems at Woodward & Lothrop, Inc. stores in Alexandria, Va.

The shopping experience

Although the average shopper may not notice, information systems are involved at almost every turn in many retail stores. Sometimes the contribution is extremely subtle.

Browsers at Seattle's Nordstrom, Inc.'s stores, for example, might find their shopping experience relaxed and untaxing, but they have no way of knowing that a computer-aided design and manufacturing (CAD/CAM) system was used to plan a store layout that put products within easy reach and spaced the aisles for smooth traffic flow.

Nordstrom relies on Intergraph Corp. 250 CAD/CAM systems for its floor plan layout. According to Walter Metzger, systems manager at Callison Partnership Architects, the consultants for Nordstrom, the

---

Leong is a former *Computerworld* West Coast bureau chief.

Store systems

FROM PAGE 67

computer systems give designers tremendous options in laying out the store departments.

"The computers give us much more flexibility and room for creativity compared with doing everything on paper," he says.

When shoppers reach the point at which they need some hard facts to make a buying decision, videodisk kiosks often provide their answers. At some stores in the Carter Hawley Hale Stores, Inc. chain, for example, shoppers interested in carpeting can obtain detailed information on the carpet manufacturers, colors and padding in this way. The kiosks, which have been installed on an experimental basis, consist of videodisk players linked with serial cable to personal computers, housed together in a single upright cabinet.

A Florsheim shoe store in San Francisco has been similarly equipped at the recommendation of Florsheim's MIS department, which saw the technology as a means of moving more stock out of inventory.

Although most of the company's stores do not carry 100% of the product line, customers now can view all the style and color possibilities and, if the shoes are not in stock, place an order on the terminal for home delivery.

The system is provided by By Video, Inc. in Sunnyvale, Calif., which has manufactured its own IBM Personal Computer clone linked to a videodisk player.

Unlike smaller retailers such as Florsheim, the large all-purpose department stores are aggressive in making sure that they have a full stock of items on the premises at all times. That is where inventory control systems come in.

By now, most retailers have developed their own warehouse inventory control applications to automatically reorder supplies.

Carter Hawley Hale, which banks its strategy on all IBM 3090 models, has implemented a "basic replenishment" strategy, a plan that aims to reorder up to 30% of its staple goods such as socks and underwear.

The IBM point-of-sale (POS) terminals with bar code scanners at the stores are on-line with the mainframes in Anaheim, Calif. If a popular color of hosiery has been purchased, the replenishment application will automatically reorder it.

Distributed sales data

Toys R Us, Inc. in Rochelle Park, N.J., operates a distributed network of Digital Equipment Corp. Microvax II computers at each of its stores. Linked to NCR Corp. cash registers, the systems forward sales data to a nearby distribution center's Microvax II.

Because Toys R Us has more than 300 stores nationally, distributed networking for the $2.5 billion company has been the key to managing inventory. To date, there are more than 700 Microvaxes running across a Decnet network.

The data transmitted to the warehouse includes orders and shipment confirmations. On this distributed network, for example, the buyers will know which board games sold at each store and find out how often they need to be replenished.

From the distribution center, the Microvax gathers sales statistics and transmits that data to the Microvax at headquarters. From there, the data finally rests in the arms of a Unisys Corp. mainframe for analysis.

The next stage in inventory control is automation and standardization of transactions between retailers and their suppliers. EDI protocol, otherwise known as the ANSI X12 standard, is beginning to take center stage for that purpose.

EDI is a communications protocol that allows stores and their suppliers to conduct business transactions electronically instead of manually. With EDI, money is saved by eliminating the amount of time, human intervention and paperwork that would otherwise be needed to process a single purchase order. According to Glenn DuBois of Levi Strauss, who is chairman of the Voluntary Interindustry Communications Standard committee on EDI standards, EDI has allowed some retailers to cut their turnaround time on orders by as much as 50%.

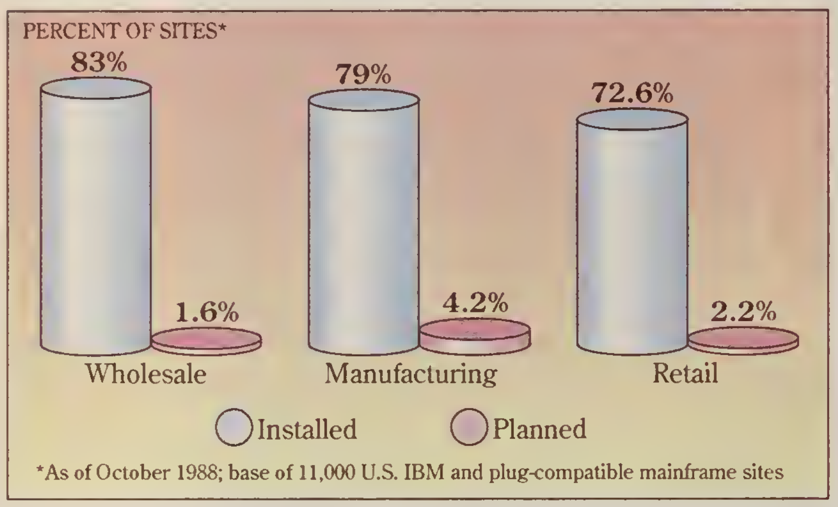
Furthermore, when EDI is used correctly, retailers are able to eliminate excess inventory, stocking only as much as they are sure they will need of any particular item.

The retail industry has developed several applications based on the X12 protocol. These include purchase orders, invoice, advance ship notice, inventory advice and price/sales catalogs.

Some retailers have been performing these kinds of activities

On order

Although retail use of order processing software lags behind that of wholesale and manufacturing operations, planned installations should narrow the gap

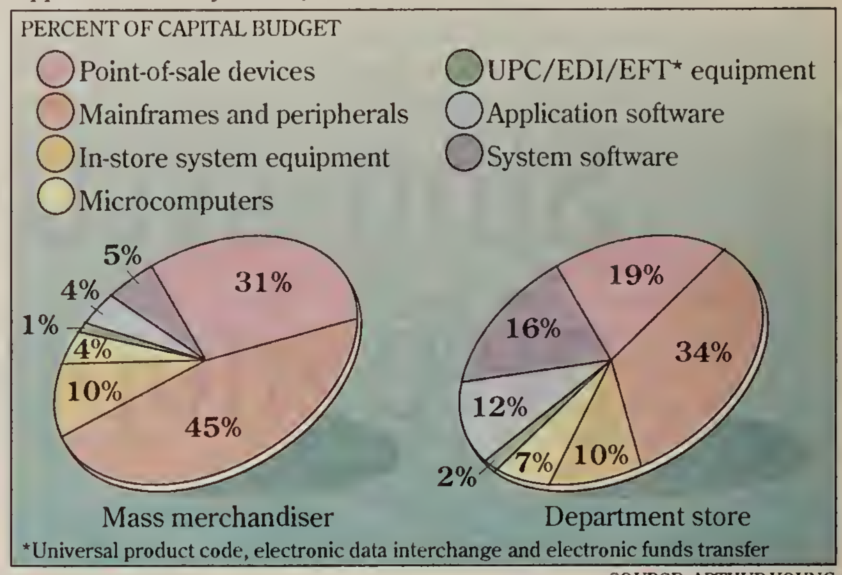


*As of October 1988; base of 11,000 U.S. IBM and plug-compatible mainframe sites

SOURCE: FOCUS RESEARCH SYSTEMS, INC.
CW CHART

Shifting priorities

Spending in 1987 for mainframes and peripherals dropped as a percentage of capital budget as retailers allocated resources to application and system software



*Universal product code, electronic data interchange and electronic funds transfer

SOURCE: ARTHUR YOUNG
CW CHART

Floor time gives MIS new view

Just before Easter this year, Norman Weiser, vice-president of MIS at Morse Shoe Co., was fetching footwear and storing sneakers as a stock clerk in one of the leased departments operated by his company in department stores.

The experience, he says, was both exhilarating and enlightening. Among other things, the exercise taught him the real cost in time and effort that results from faulty merchandise-marking procedures.

"If the shoes don't come in marked, you've got to find the right number, go all the way across the store to get the tickets made, come back to the department and put the tickets on the shoes. For a case of 18 pairs, you could wind up losing 10 minutes," he says.

This was a particularly timely lesson, Weiser says, because at that point, Morse was in the process of converting from its old print punched-ticket system to more modern forms of marking, including bar coding, used by the stores from which it leases space. "Seeing the labor involved made me push harder back at the office for making sure that the shoes were properly marked when they got to the stores," he says.

The program that landed Weiser, who is now retired, his moonlighting stint did not actually start with him, and the company had more in mind than just providing a continuing educational opportunity for MIS staffers.

It came about last year, he says, as the busy back-to-school season approached. Field operations management and the personnel department decided not to hire temporary workers to deal with the coming crush; instead, the firm would look for volunteers among regular company employees.

Weiser promoted the idea enthusiastically among his staff. It was one of his employees, after putting in his time on the floor, who suggested continuing the practice.

Although working field trips are certainly not the rule in retailing, they are also not the exception.

At Carter Hawley Hale Stores, Inc., MIS personnel are encouraged to spend time on the floor, observing the behavior of customers and watching the sales clerks.

The experience is priceless, says Vince Conant, chairman and chief executive officer of Carter Hawley Hale's information services. As an example, he cites a network manager who once served as a sales clerk; the manager made needed improvements in a POS application that later alleviated frustration for the other clerks.

Visits encouraged

Although Sears, Roebuck and Co. does not have a work exchange program, the retailer does encourage MIS professionals to visit stores, talk to the users of their applications and watch them in operation.

"If a programmer has written a distribution application, we want him to go out to the distribution center to see how it actually works," says Chuck Carlson, vice-president of MIS in the retail merchandising group.

There is some evidence that, even without such exercises, MIS personnel in retailing are somewhat better grounded in their business than many of their peers in other industries.

A Touche Ross & Co. survey conducted at a recent National Retail Merchants Association conference on information systems found, for example, that 80% of the MIS attendees had worked for three or more years on the nontechnical end of retailing.

Even so, Weiser claims, a refresher stint never hurts. "You can't hear the cash register ring when you are in the corporate office," he says, "and it is easy to forget that you are in the business of selling merchandise — not programming worksheets or computer printouts."

KATHY CHIN LEONG

Morse Shoe's Weiser *back in the trenches.*

electronically for a while, using proprietary software. The advantage of X12, however, is that it broadens the possibilities for information exchange by standardizing formats and eliminating the need for suppliers to support multiple proprietary systems.

The EDI advantage

A few companies are already using EDI in an advanced way, exchanging information via networks with literally hundreds of trading partners.

Mervyn's in Hayward, Calif., for example, has been using EDI since February 1987 and is already electronically buying from 130 suppliers. The turnaround time for delivering goods has improved from a week to a day. With EDI, one Mervyn's hosiery buyer has reported a monthly sales increase of 26% compared with sales before EDI implementation. Because stock is replenished more quickly now, customers get what they want when they want it, according to Mick Connors, vice-president of MIS at Mervyn's.

Still, according to DuBois, it is only the largest retailers that have implemented EDI. The majority of retailers are interested in the merits of EDI but have yet to get started on their pilot projects.

If, thanks to well-designed layouts, kiosk information assistance or the silent efficiency of an inventory control system, a shopper has located merchandise that he wants to purchase, we come to the matter of payment.

Let your fingers do the shopping. Florsheim Express Shops' kiosks let customers order shoes electronically.

This phase of the shopping experience has always been the most unpleasant, not because of the exchange of money but the time spent waiting to complete the transaction. Elimination of lines is an elusive goal, but it is one that many retailers are pursuing aggressively with information systems' resources.

Mervyn's, for example, has installed IBM Series 1 processors running price management software at its 24 stores across the country. Each price management system maintains current prices on all the stock items in the store, which usually amounts to at least 150,000 items.

These prices are regularly checked against a master file on the IBM 3090 Model 400 host in Hayward, to which all the stores are connected via an IBM Systems Network Architecture network. This arrangement avoids having checkers thumb through catalogs and newspaper ads checking sale prices while customers stand and fume.

Waiting in line once is bad enough; according to national electronics and home appliance retailer, Circuit City Stores, Inc., customers should not have to do it repeatedly just because they want to buy items from different departments. For that reason, the Richmond, Va.-based company uses software that allows customers in its 125 branch stores to pay for all their goods at a single register.

The system is based on software developed internally and a custom in-store minicomputer that can handle up to 64 devices, including POS terminals and printers. Circuit City's system works as follows:

A customer selects a refrigerator, and the salesman enters the sale on his register and prints out the customer's number. From then on, the customer can go to another department and pick a television, for example, and simply give his number to that salesman.

By the end of his shopping expedition, the customer goes to the checkout stand with his number, and the checker merely enters the number, and the total appears.

Meanwhile, the order has been transmitted to the printer on the receiving dock. By the time the customer pulls his station wagon around, his purchases are waiting for him there.

Customers have been paying for their goods in this fashion at Circuit City stores since 1981. The in-store setup is new,

Continued on page 74

Targets for improvement

BY THOMAS H. FRIEDMAN

Retailers are on the threshold of realizing exceptional value from technology. High-performance computers have come down in price. Software developers have rallied around a few popular database and operating systems. Industry committees have established electronic document communications and merchandise bar code standards.

An emphasis on cost control, management inventory and merchandise planning has pushed forward these developments and put information systems into the spotlight. This emphasis signifies a radical change from the past. Most retailers viewed technology as an expense rather than as an investment, creating a computing environment that stands woefully behind the financial and manufacturing industries.

To truly catch up and become a technology-driven industry, retailers must develop in the following areas:

- **Electronic Data Interchange (EDI).** Retailers must use EDI for broader applications than just ordering, invoicing and payment. Instead, they should use EDI for just-in-time inventory management. Retailers, suppliers and transportation companies recently started working together through the Voluntary Interindustry Communications Standard committee on the so-called "quick response" initiative. This initiative combines newly developed bar coding and EDI standards in order to improve coordination between basic manufacturers, vendors and retailers.
- **Decision support systems.** For the quick-response initiative to work, it also requires improved decision making. Retailers are basically streetwise people who have made major decisions based on gut instinct. Because quick response and other new retail practices will reduce ordering and delivery schedules, they will demand faster, more accurate decisions.

Decision support tools will consider cycles, trends, seasonal fluctuations, current inventories and current and future demands. In addition, with industrywide introduction of bar code scanning, retailers will soon have large amounts of timely data for analysis. Only with these decision-making tools can retailers turn quick response and scanning into business advantages.

- **Relational databases.** To support decision-making tools, retailers must acquire relational database technologies. Rational databases will allow retailers to search and cross-reference merchandise, price, customer and other information automatically.

With ad hoc query and SQL capabilities, retailers will also be able to improve report-generation without extensive amounts of backroom programming. Currently, most major retailers use hierarchical databases.

- **Networking.** Networking promises to allow retailers to grow and preserve current hardware and software investments. Few retailers have linked their various retail applications. For example, a mass merchandiser might have an inventory control application and a pharmacy application operating independently. With the current merger and acquisition trend, networking new stores into an existing system also has become of paramount importance.
- **End-user computing.** Another area in which retailers are behind is in end-user computing. Few retailers have set up the infrastructure for end-user computing. They must, however, create information centers to help increase individual productivity with the availability of user-friendly relational databases, personal computer-based executive information systems and office automation applications. It is time that retailers put computers to work throughout their organizations.

Friedman is editor and publisher of "Retail Systems Alert," a monthly newsletter based in Newton, Mass.

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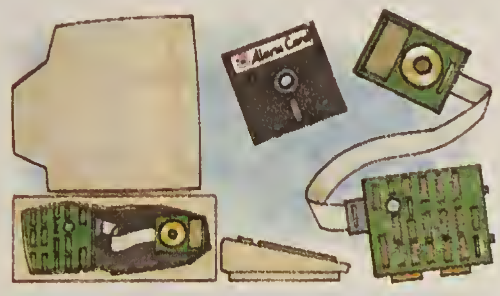

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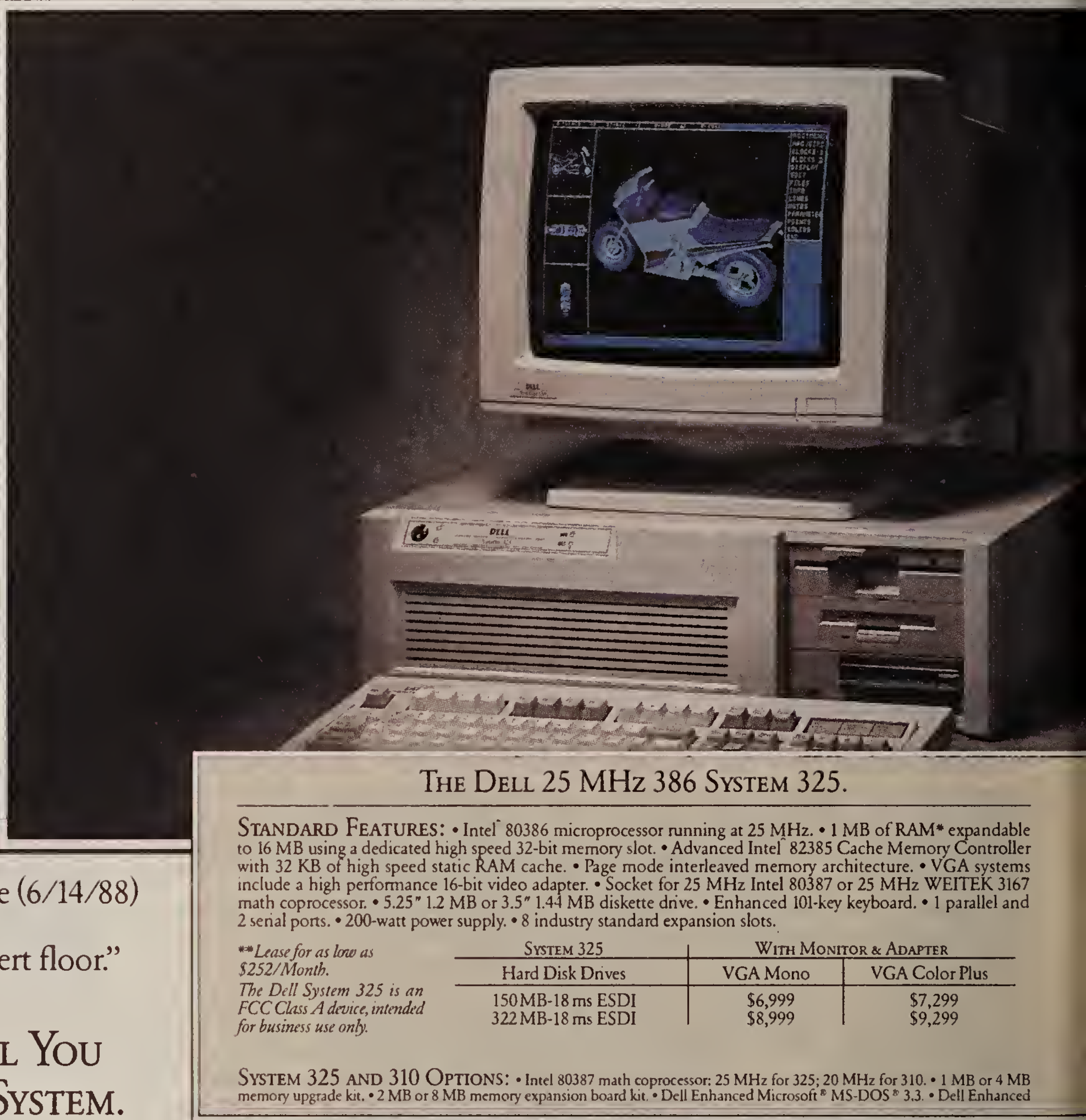

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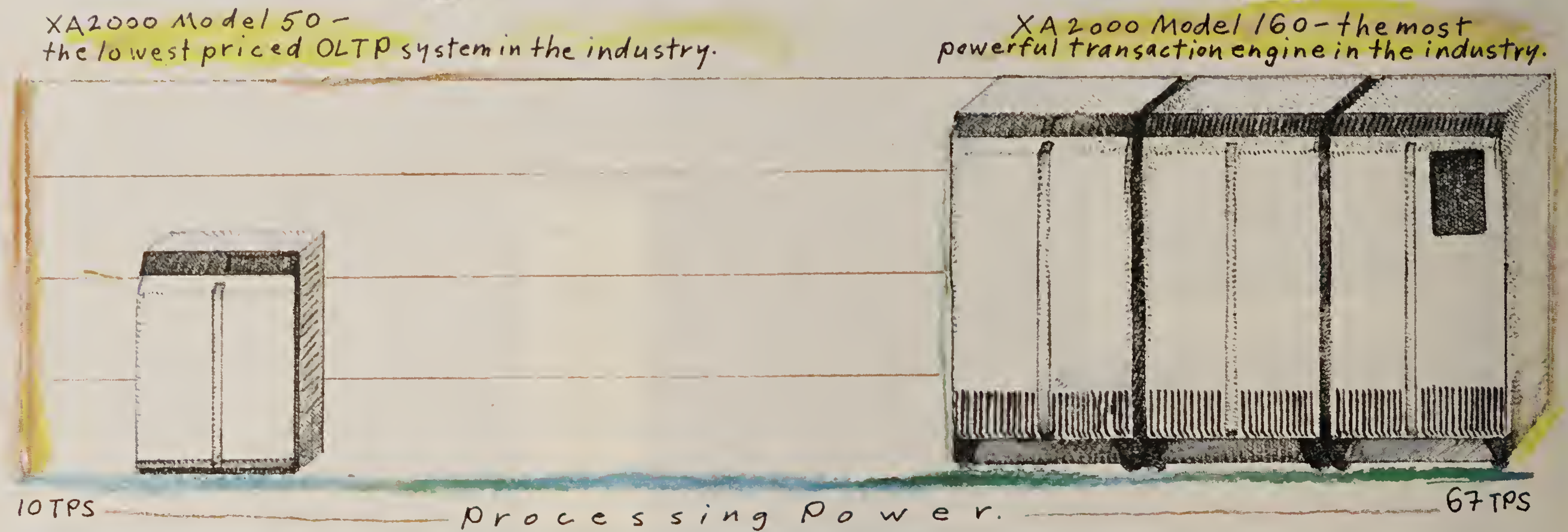
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POSitive steps to uptime

BY DANIEL McCARTHY

The biggest drawback of today's technology is that when it falters, users can be completely grounded. Many businesses have become so dependent on the technology that they could not begin to do their work by hand even for a short time.

Retail organizations that use point-of-sale (POS) systems are particularly vulnerable. To understand how to minimize malfunctions, a company must first understand the POS network it uses. There are a number of ways that the network for POS systems can be configured. These include the following:

- One master terminal with slaves. Slaves are terminals that have just enough intelligence to process transactions; usually no more than five to 10 are attached to one master at one time.
- Multiple masters with slaves (with one master as a backup for another master).
- A controller — a master unit that can handle a larger number of slaves than a master — with a number of slaves. This configuration may originate on a personal computer or a minicomputer, and it may have a serial loop configuration, with single-store or multiple-store configuration. It may have intelligent or dumb terminals.

In the case of dumb terminals, the controller performs all activities for the terminals. When intelligent terminals are used, the controller provides backup and centralization of key files for those terminals. The controller is often backed up by a dual-minicomputer arrangement in which processors back up each other.

Retailers find these kinds of configurations more cost-effective than those in which each register stands alone. The redundancy provides insurance against a processor failure and the corresponding risk of not being able to ring up sales.

Why networks go bad

There are many reasons why a network may fail: bad cable, wiring that was never upgraded, reversed polarity on ground wires, power surges, lightning storms or brownouts.

In a retail setting, however, POS networks are likely to fail when a single terminal goes down, causing a loop to fail, which then triggers a chain reaction of terminal failures. The problem can be minimized by inserting a circuit isolator, a device that allows serial loops to run in parallel between the controller and terminals. This method allows retailers to isolate a terminal within a loop.

Another way to minimize the impact of this kind of malfunction is to provide additional memory within a terminal. If the controller fails, or if a single terminal fails, the individual terminals will retain the register program, allowing the cashier to continue to ring sales. All that is lost during the failure is the ability to perform extended functions such as price look-up or credit authorization.

Another type of malfunction, which occurs frequently in large networks with multiple controllers, is cluster failure of terminals. This kind of failure, in which all terminals in a specific area of a store go down at the same time, not only impedes the staff but can cause customer dissatisfaction by slowing the checkout process.

Cluster failure can be reduced by locating terminals in the same area on different loops. That way, if a failure does occur in one loop, at least some terminals in the area can continue to operate.

Retailers are finding greater reliability in POS equipment, as shown by the reduction of serious malfunctions. Another contributor to improved reliability is modularity, in which each component of the POS terminal — both internal and external — is separate and can be assembled in a number of different ways. This advancement has reduced the need for technicians. In many instances, technicians are now becoming "board swappers," correcting a malfunction with a simple switch of the appropriate board.

In addition, user-operated Help desks can provide quick, simple answers to questions about malfunctions, thereby eliminating a service repair call. Many such problems can be corrected with one phone call, cutting the downtime drastically.

Help desk personnel maintain logs that describe the types of problems reported, their location and the time they were called in. The logs help determine trends and patterns in terms of hardware malfunctions and software bugs. Sometimes a review of the logs points out the need for additional POS training in certain stores.

Many companies have also mastered the art of self-maintenance. They keep a stock of frequently used parts or components in a central location, dispatching them as needed to various locations. Some companies have begun to centralize the maintenance function or authorize repairs from a central location to ensure that common or simple errors have been fixed before calling the service technician.

The best way to ensure uptime is preventive maintenance. This includes making sure contract-specified scheduled maintenance, such as paper-tray cleaning and ribbon checks, is done. The availability of the Help desk also offers a measure of protection against unnecessary downtime. •

McCarthy is a manager in Touche Ross Co.'s Retail, Apparel Manufacturing and Distribution Enterprises (Trade) in New York.

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Store systems

CONTINUED FROM PAGE 69

> RETAILERS HAVE YET to exploit the full potential of using technology for focused customer marketing, but a few are making significant strides.

however. Branches used to operate off a host-dependent network of Hewlett-Packard Co. HP 3000 minicomputers all based at headquarters. The objective in introducing a decentralized network is to relieve dependence on host systems in case of a communications failure.

Another advantage, according to Terry Kelley, MIS director at Circuit City, is that each store's computer now maintains its own database of customer buying records, which can be accessed by customer service reps and equipment repair personnel. The intent, he says, is better customer service, not marketing.

In fact, the process of creating this improved customer service system led the retailer into a new business area. Circuit City has acquired Patapsco Design, Inc. in Frederick, Md., the company that produces the minicomputer on which its system is based.

Exit doesn't mean the end

So far, we have been talking about in-store service, but actually there is more to the current emphasis on the customer than just trying to create an effective sales environment inside the store. These days, retailers are working very hard to extend their relationship with their existing customer base in ways that will help them draw people back to the store.

Integral to this effort is the data that can be culled from the magnetic strip on a purchaser's charge card and merchandise data picked up by a store's bar code reader and fed into a centralized file.

Next time a record company, for instance, sends a customer a letter, it can also ask that customer if he liked the compact disks he purchased last month and let him know about an upcoming sale on compact disks.

"It is amazing how much information the retailers can obtain on their customers," says Leone Johnson, a consultant at Venture Development Corp., a Natick, Mass., firm specializing in retail automation. "Now, the retailer knows how often the customer shops at his store, how often he uses checks or credit cards and what types of things he likes to buy. That information is definitely used in direct mail."

Retailers have yet to exploit the full potential of using technology for focused customer marketing, but a few are making significant strides.

Sears' Carlson

At Woodward & Lothrop, advertising and marketing personnel are using an in-house-developed credit management system that keeps track of well over one million customers, Ackerman claims.

The program, developed with the Adabas development tool from Software AG of North America, Inc., allows retail marketers to keep tabs on what items have been sold, who purchased them and where they were bought.

"We use it to help us select who to send our materials to," Ackerman says. "It would be a waste to send catalogs to every customer in the database. The system targets our most active customers."

Customer information on databases can also help retailers fine-tune their merchandise offerings by pinpointing which products are and are not selling well. For example, last year, Pep Boys, Inc., a Los Angeles-based car parts retailer, discontinued selling bicycles after spotting

Continued on page 76

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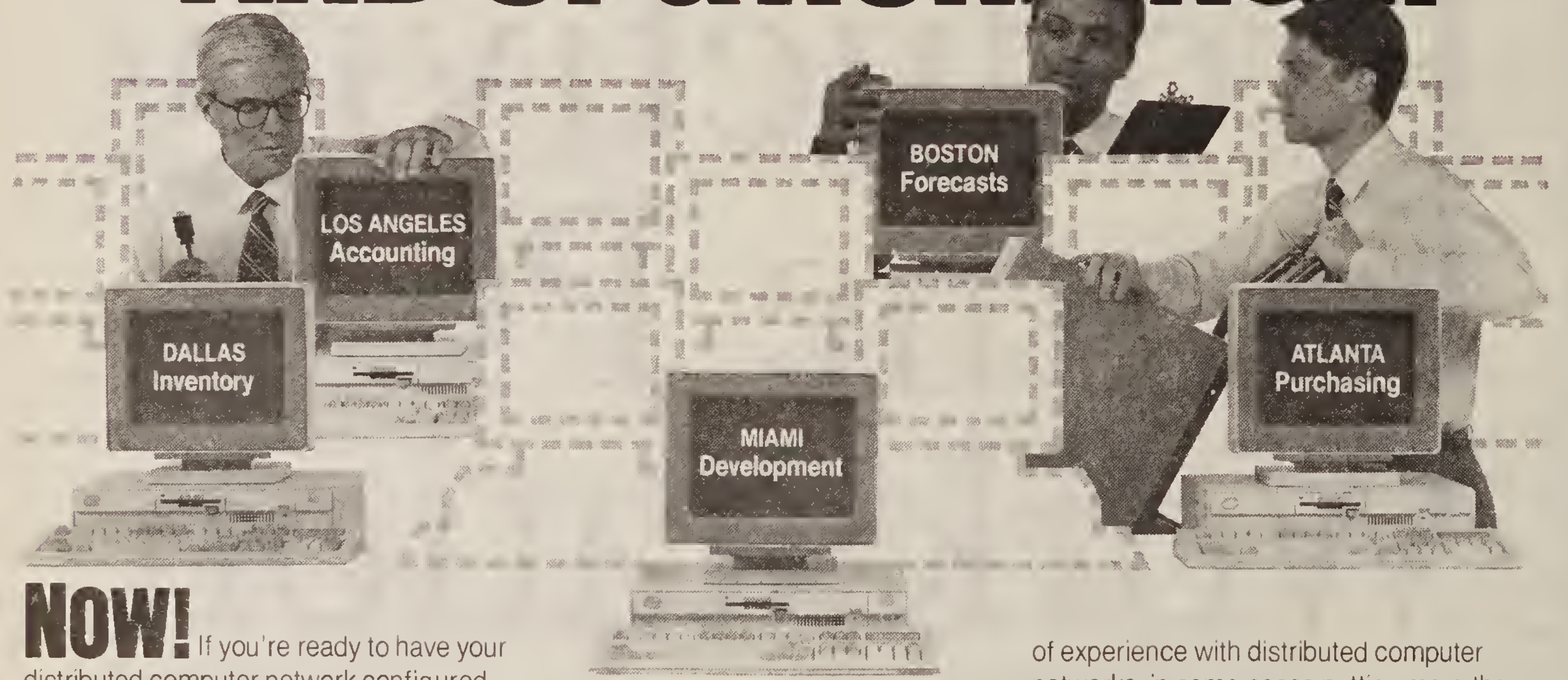

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Selling the store leaders

In retailing, as in any industry, the critical element in making an MIS strategy work is the support of top management.

Some industry analysts, such as Daniel Corbett at Deloitte, Haskins & Sells in New York, say they believe that top managers in retail are becoming bolder in their computer support. "People are willing to spend more money to cut someone else's profit margin," he says.

And based on the testimony of MIS executives from K Mart, J. C. Penney and Sears Roebuck, it does seem that, at least in the big leagues of retailing, senior business managers are both knowledgeable about systems and fairly willing to invest in new technology.

At J. C. Penney, for example, the senior executive staff is involved with every major systems decision. According to Dick Skinner, director of systems and programming, each month the chairman of the board and an executive committee review and discuss the technology projects the company wants to implement, which may be as many as eight in any given month.

"They want to be involved," Skinner says, but notes that this kind of participation by senior executives is "pretty rare in the retailing industry." More typically, according to John Chay of the National Retail Merchants Association, information systems managers must make a continual effort to garner executive support.

For Charles Mitchell, vice-president of MIS at Seattle-based Nordstrom, Inc., there are two keys to wooing senior management. First, he says, "Tell them how your strategy will make a positive impact on the company." Second, make sure that you are prepared to demonstrate how a new computer or software application will simplify work for the staff.

A little bluntness does not hurt either, according to Chuck Carlson, vice-president of MIS in the retail merchandising group at Sears. "If you're in a situation in which the management is indifferent, you have to work on convincing them about the benefits of technology," he says.

And sometimes the only way to be convincing is to take a firm and aggressive stand. "You practically have to rub their noses in what the competition is doing. That will surely give them cause to start investigating the process."

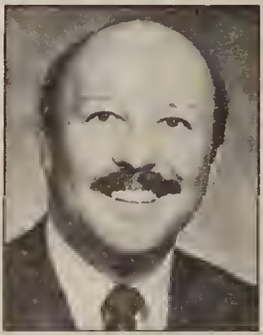
KATHY CHIN LEONG

Store systems

CONTINUED FROM PAGE 74

a persistent downward trend in sales of that item. The decision to stop selling bikes allowed it to offer small car-related items, which sold faster.

Retailers are aggressively adjusting their systems in order to better understand customer needs and wants. Chicago-based Sears, Roebuck and Co. is developing a customer database to provide the company with a single profile of the Sears consumer, says Chuck Carlson, vice-president of MIS in the retail merchandising group.



Mervyn's Connors

Today, Sears customer lists are spread across various databases, such as the credit card database, the catalog database and a service database. Like many retailers, Sears does not have a consolidated customer file that shows a person's history of Sears transactions made over the years.

"It is an ultimate goal to get to this individual profile," Carlson says. "We would be able to target our marketing efforts even more effectively."

As it stands, different departments are accessing a variety of these databases to cater to the Sears customer. The direct mail marketing group collates information to send flyers to new mothers, for example, whenever there is a special sale in the infant department.

J. C. Penney Co. in Plano, Texas, is also shrewd in massaging customer data. Because it has an insurance business, credit card company and mail-order house, employees have access to these different lists. "We use these files mainly in our catalog mailings to make sure they get to the right people," says Dick Skinner, Penney's director of systems and programming. "After all, sending these does get very expensive. We identify our largest customers on the basis of their past performance with us."

Buying spree

As employees learn how to take advantage of vital customer statistics, retail MIS departments are, themselves, becoming very good customers for both discrete systems and integration aids.

According to Venture Development, the industry purchased $1.6 billion in retail automation gear last year and is expected to spend $1.8 billion in 1988. Johnson considers the figure a healthy increase, an indication that MIS retailers are not afraid to make purchases and try new things.

On the hot list, according to Bob Salerno, a Coopers & Lybrand analyst in New York, are intelligent POS terminals, layaway systems, bar code scanning devices and on-line credit authorization systems.

Analysts note that NCR in Dayton, Ohio, has dominated much of the POS

Continued on page 80

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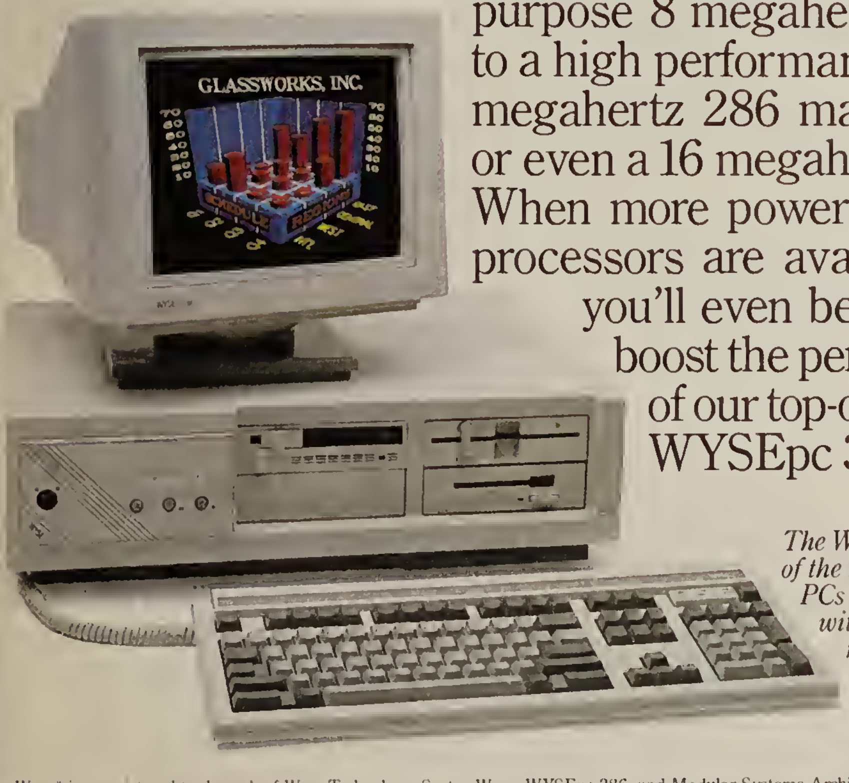

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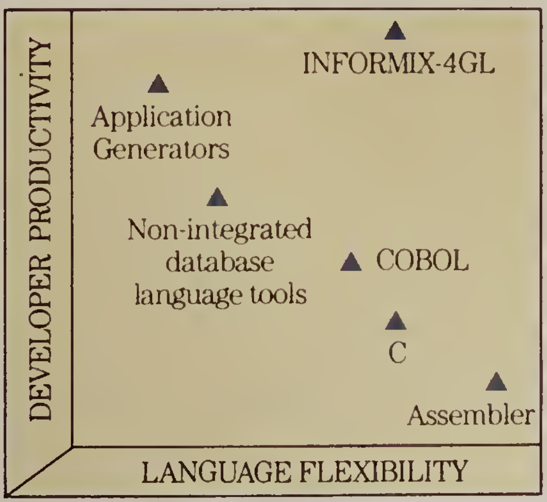

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Store systems

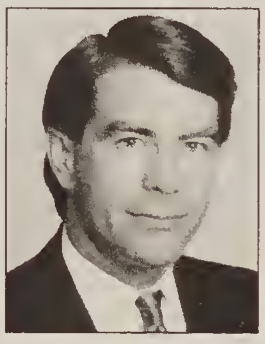
CONTINUED FROM PAGE 76

market; IBM has controlled the systems marketplace with its mainframes and minicomputers. Large IBM mainframes are used primarily in headquarters. The Application System/400 is predominantly found in medium-size companies. The AS/400 is becoming more popular because value-added resellers are emphasizing its expandability and software portability to potential users.

DEC and HP are also strongly signaling their interest in this market. Both firms made their presence known with large booths and hoards of sales representatives at the October NRMA Information Systems show in Washington, D.C.

Integrated effort

While the largest chains are willing to experiment with innovative technologies and newer applications, the majority of retailers are concerned with how to integrate their existing devices. According to Venture Development's Johnson, retailers have been picking up a variety of computer devices in the past few years.



Levi's DuBois

"Now, the problem of integration is hitting these guys, and they have to face up to what they have to do for the future," she says.

Companies such K Mart Corp. have already tackled the problem of dissonant computer systems. According to K Mart's David M. Carlson, vice-president of corporate information systems, the company relies on both IBM and NCR as its main equipment providers.

Carlson lets these suppliers know that they must develop products that will allow one to sing in tune with the other.

"We make sure we work with at least two computer vendors," he stresses. "If you rely on one, you are bound to experience stock shortages and price increases. Playing with two is safer."

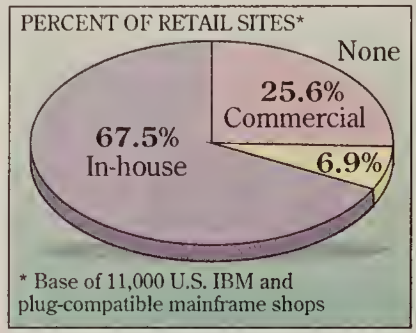
And the vendor community is taking steps in the integration movement by developing compatible hardware interfaces. NCR, for instance, offers interfaces that will work with its cash registers and with computer equipment from HP and from IBM.

There is long way to go before then, but William Clark, technology retail analyst at Ernst & Whinney in Minneapolis, predicts the day will come when "all retail devices from the mainframe down to the POS terminal will be tied together in one big loop."

Successful computer implemenation also requires the training of non-MIS personnel in the use of computer technology.

Rolling their own

Ready-made order processing software is still a rarity in retailing



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With this requirement in mind, non-MIS personnel at Carter, Hawley Hale are encouraged to enroll in various computer classes to become more proficient in using their desktop tools. Carter, Hawley Hale has had an educational computer program since 1984; the program is intended for use by top executives, branch buyers and other administrators.

"We have 5,000 to 7,000 decision makers at this company," Conant says. "Equipping them with personal computers would be too expensive, so we have created user-friendly desktop applications for them to use on their terminals." Word processing and spreadsheet programs are just some of the applications Carter, Hawley Hale offers.

Likewise, Sears offers various training programs for managers that are applicable to their specific areas of interest such as accounting or sales.

With more information at its fingertips, the sales work force is expected to be more of a help than a hindrance in the year 2000.

Coopers & Lybrand's Salerno says, "Technology will make the sales force more professional and knowledgeable. Instead of a bored 19-year-old talking to her boyfriend at the POS terminal, you will be waited on by a careful professional who will make the effort to check your computer file routinely and call you when there is a sale on your favorite items." •

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Can your async network pass this simple test?

Make a list, check it twice: Retailers plan for holiday rush

BY PATRICIA CINELLI

Visions of crowded shelves and overloaded point-of-sale systems start dancing in the heads of retail information systems personnel as early as September.

Although retailers experience fluctuations in their business several times during the year, no other season holds as much boom-or-bust potential as the Christmas rush.

To deal with the extra load put on data processing systems during the holidays, MIS professionals in the retail business try to plan for every conceivable contingency. They sometimes arrange for additional power capacity, equipment and personnel. They stabilize communications and all but eliminate new system installation and testing. And most important, they remain flexible.

"Store personnel get so psyched up that they're like athletes who prepare for a big race. Everyone's geared up. It's a make-or-break time," says John Chay, vice-president of systems at the National Retail Merchants Association.

To say that lists are checked twice would be a drastic understatement. "We do about 20% of our business during the last six weeks of the year," says Jim Carolan, senior vice-president of MIS at The Gap, Inc. stores. "We plan, we check and double-check, then, when we approach the Christmas season, we put on our seat belts, cross our fingers and hope [customers] show up in the stores."

The Gap has more than 800 stores in the country, including The Banana Republic and Hemisphere stores. Because of the limited amount of stock storage space in its stores, The Gap must increase its deliveries from distribution centers to its stores as the pre-Christmas velocity increases. Starting in November, deliveries increase from a minimum of one per day to three or four per day. The Gap's two IBM 3083s keep track of what stock is coming in and when it is expected to arrive.

Carolan says the mainframes call individual store computers every night to find out what products have been sold and what products are needed. "Because the volume increases [during the holidays], we need to add additional polling lines to handle the load," Carolan explains, adding that the company leases additional computer storage capacity for the peak holiday season.

"Because we are selling more, each call to a store takes more time. We usually have a four-hour window to do our polling in order to meet all our other considerations. If we didn't add lines, it would go to a six- or seven hour-window, which is too much time," he says.

Bean's Soule

In addition, Carolan says it is critical that The Gap maintain a stable environment during this time. "We put freezes on nonessential changes to critical systems, such as inventory, sales, distribution and communications," he says.

Carolan points out that there is also increased vigilance in communications during the heavy season. "We watch the entire operation much more closely. We have to communicate our expectations and changes in our business needs. We anticipate to the best of our ability."

L. L. Bean, an outdoor sporting goods and camping equipment store in Freeport, Maine, that does 85% of its business through mail order, typically greets the peak season with a newer and bigger leased mainframe.

"We upgraded to an IBM 3090 500E from a 200 this October. In some cases, we downgrade after the Christmas peak, although we seldom downgrade to where we were before," says Stafford Soule, manager of data services. "Our network is increased by over 40%, our CPU is increased in excess of 100% and our number of direct-access storage devices is increased in excess of 30%."

L. L. Bean's upgraded computer system was designed and chosen primarily to handle the volume of orders during Christmastime. "We do our computer modeling in the spring. We know what our budget is. We take the information that the computer system collects based on given volumes and project what that system needs to look like in the fall. We generally add some kind of buffer [about 10%], in case we are wrong. So far, we haven't been," Soule says.

L. L. Bean does add temporary employees on a three-month basis, primarily in the operations area, in which volume increases with the business.

"For example, we increase our number of printouts. In addition, we add a few people in our network area, the area that supports the total terminal network throughout the company. We add 500 or so terminals during our peaks and add 1,000 or more people to take orders and

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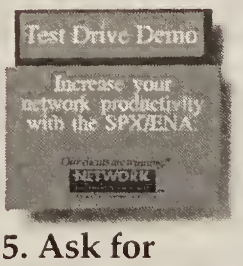

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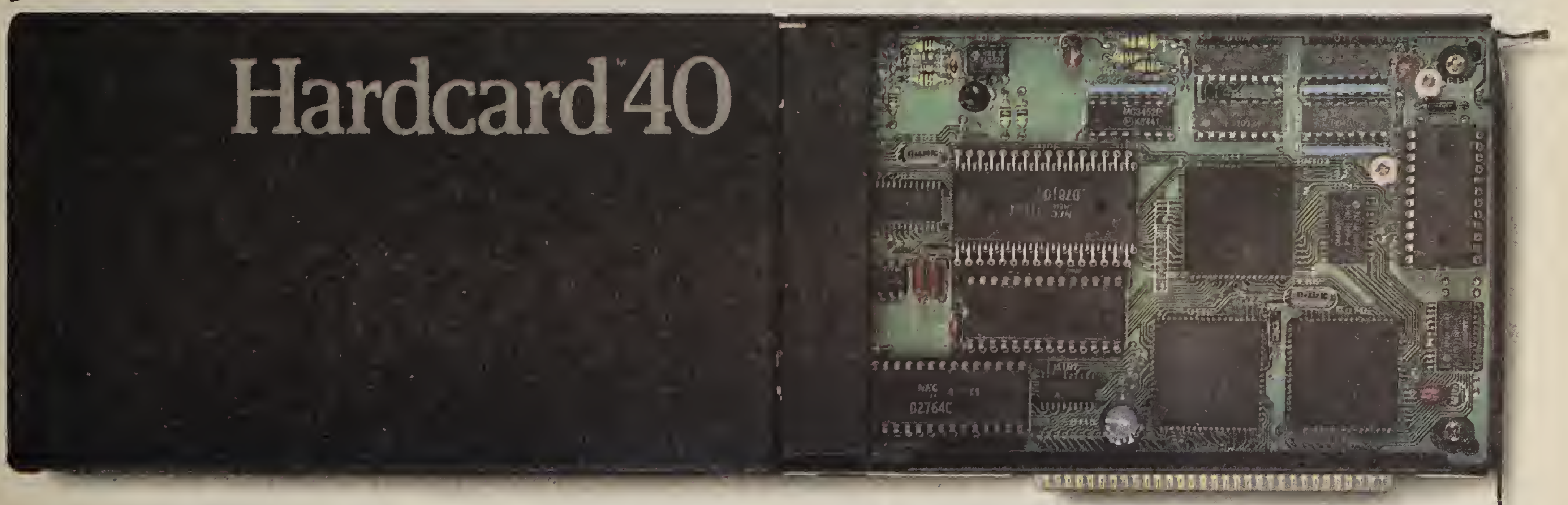

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Holiday rush

FROM PAGE 81

customer service requests," he says.

Another large department store chain, Woodward & Lothrop, Inc., also brings in additional equipment in advance of the Christmas peak season. Ron Ackerman, senior vice-president of systems, says the equipment, designed to get the chain through the holiday peak and the following year, is usually installed in September or October. The chain also adds capacity for disk storage because of the increased number of transactions.

Woodward & Lothrop has an IBM 3090 200, an IBM 3380 disk storage system and an IBM 3480 tape cartridge subsystem housed in its headquarters in Alexandria, Va.

As in any large chain, flexibility is a key for smooth operation at Woodward & Lothrop. During peak season, "we also change our schedule so we can process jobs at night that are normally done during the day to accommodate the large capacity that is going on during the day," Ackerman says. "For example, staff may be testing a new payroll system that needs to be implemented in January. You can't conduct parallel tests during the day, because you want to keep the programming staff off the machine and give on-line capacity to customer authorization, credit authorization and so on. If the testing is critical, you might have to do it off-site," he says.

Carter, Hawley & Hale's Conant

Dreaded Grinch

For retail information systems staffs, downtime is the dreaded Grinch. Vince Conant, chairman and chief executive officer of information services at Carter, Hawley and Hale Stores, Inc., learned first-hand several years ago how crucial it is to anticipate every possibility, especially during the heavy holiday season. When a rainstorm flooded out Carter, Hawley and Hale's underground cable telephone lines, all communications with its five divisions — about 120 stores — went down.

"We needed to have alternate routing for communications, and we did. We reinstated [communications] with the stores within four hours," he says. "During those four hours, the stores functioned under emergency procedures with very little effect to the customer."

After this potentially disastrous incident, Conant understands the value of being one step ahead of any possible disaster; Carter, Hawley and Hale begins planning for the next year right after Christmas.

"I tour our stores in Southern California after Christmas to see how they reacted to problems and peak loads," he says. "Last year, I learned about a problem that I probably would not have considered otherwise by talking to one of the sales managers. He told me that since our stores do not often experience a communications interruption, employees don't have that experience. There is enough panic on the selling floor [during Christmas] even without a crisis. He felt they could be more familiar with procedures in case a communications breakdown occurs."

As a result, Conant has set up test runs that are conducted during off-peak times. During that period, store personnel take a crisis situation, such as a power loss, and act out what they would do in that situation.

But, at the risk of acting like Scrooges and not wanting to take too much for granted, retail MIS departments do not give themselves much time to relax. As soon as one hectic Christmas season is over, planning immediately begins for the next year's rush. According to Chay, most stores keep a running critique of what happens during each holiday season and how they can best prepare for next year.

"Retailers recognize how important [planning] is to business — it's profit and continuity," Chay says. "They don't just think about planning but document it and document it early." •

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Database directions

With the advent of distributed processing, smaller DBMSs may take the helm from DB2

BY FRANK SWEET

The MIS world is embroiled in the battle of the database management systems. The struggle rages on between IBM's DB2 and older products like Cullinet Software, Inc.'s IDMS, Applied Data Research, Inc.'s Datacom/DB, Software AG of North America's Adabas and Cincom Systems, Inc.'s Supra. Meanwhile, minicomputer-based products, such as Relational Technology, Inc.'s Ingres, Ashton-Tate Corp.'s Dbase and Acius, Inc.'s 4th Dimension, are also fighting to stake their claims.

Might these small newcomers inherit the DBMS world? Does the future conceal a scenario in which the meek wind up outliving the large entities? There is good reason to think so, because of a trend now under way in the industry that is just too strong to ignore: Processing is becoming dispersed among desktop workstations and, thus, among end users.

So the promise of today's approach to distributed databases is that it lets end users make the decisions. This setup is valuable not only because end users are more likely to make the proper business decisions — and to live uncomplainingly with the consequences — but also because they need not pay specialists to do it for them.

What are today's trends in database technology? Which ones are likely to endure the next swing of fashion's pendulum?

TIM LEWIS

How will mainframe-to-micro dispersal deflect these trends? We will try to answer these questions by discussing three topics: data manipulation and use, data collection and storage and data definition and design.

Twenty years ago, designers could build a DBMS to lock users in by locking foreign files out. It was a tradition in MIS. Today, such an attitude is considered suicidal. Otherwise sound personal computer packages, such as many of the original spreadsheets for the Apple Computer, Inc. Macintosh, failed because they could neither import nor export other products' files.

Until recently, much of the connectivity problem was due to the lack of a common language. How can a desktop application ask a file server to send down all the invoices for a given customer without knowing if invoices are sorted, indexed or grouped by customer identification? What language could it use? A data manipulation language was needed that was independent of physical file organization at the server and acceptable to all the vendors involved.

Enter IBM. The company's database language, the Structured Query Language (SQL), is neither structured, nor limited to queries, nor a language. It is not structured because it does not enable developers to write functions or subroutines, as does IDMS's Logical Record Facility (LRF), for example. SQL performs updates as well as queries — it must, of course. A DBMS that cannot update would be pointless. And SQL is not a language, because a person cannot write logic in it — he can only access data.

SQL's syntax is mediocre at best. It displays IBM's notorious style. It has so many different ways of accomplishing the same thing that it is hard for one person to understand another's program. Its inventors must have thought it undesirable for Sam to understand Sally's program at any time, even when an emergency arises in which operations needs help at 3:00 a.m.

Even with these drawbacks, SQL has emerged as the de facto standard for interprogram data requests. For years, the industry has needed a way in which a program could say, "Get me the purchase orders for Vendor 123," regardless of whether purchase orders were physically indexed or chained on vendor number, and this ability is what SQL provides.

It is unlikely that SQL will

Sweet is president of Boxes and Arrows, Inc., a database engineering firm in Jacksonville, Fla.

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- **Data-driven approaches make a comeback**
- **SQL: In the right place at the right time**
- **Don't substitute software tools for training**

ever be popular among programmers. Languages should be lean and easy to learn, and SQL is too fat and complex. But it was at the right place at the right time.

SQL is becoming the accepted way for programs to talk to each other about data, because it is general enough to handle virtually any data structure. It describes the end result. The program originating a request simply states what it wants. The recipient of this get-the-facts request must figure out how to provide it.

The other half

Today's trends recognize that application processes come in two kinds of programs — those that put raw facts into a database and those that pull processed information out. Most of what has been discussed so far deals with retrieval. What about the other half of the business — data collection and storage?

Two aspects of data collection and storage have remained constant during the mainframe-to-micro dispersal — data administration and the need for trained technicians. Data administration remains unaffected by hardware and software trends. At the organizational level, where a central integrated database was a good idea, it continues to be a good idea. Where such control was too costly, it continues to be too costly.

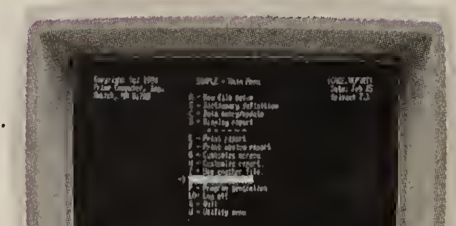
MIS migrates functions to PCs because processing costs less there. Having downloaded the customer's invoices to a desktop PC, a credit manager can sort them, summarize them, tabulate them, search through them for exceptional conditions, detect trends among them, cross-foot their fields, copy selected rows into a spreadsheet or turn columns of numbers into bar charts and graphs. More important, he can do it all without involving MIS.

But although processing dispersal is technologically possible, it is not always desirable. There are some functions that should be centralized for business reasons, not technical ones. Centralized facilities will continue to house an organization's integrated database. It is cheaper to ensure that data is backed up, consistent and up-to-date if the official master copy is in one place or under one data administrator's control.

DATA ADMINISTRATION remains unaffected by hardware and software trends. At the organizational level, where a central integrated database was a good idea, it continues to be a good idea.

From the information user's viewpoint, it is a question of economics. It costs less to pay a commercial bulletin board to collect flight schedules for everyone than for each department to maintain a private version. The latter approach is possible, but it entails more work than it would be worth. Similarly, it is not cost-effective for each of the sales, receivables and shipping departments to maintain a file of customer orders.

Data administration's role is unlikely to be affected by current data collection trends. If anything, putting a read-only copy of



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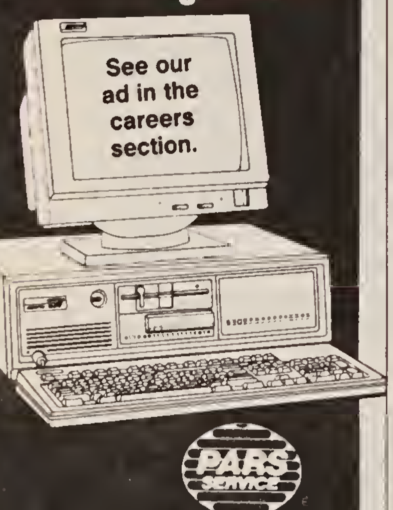
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detailed business activity in each server makes it more important than ever to have someone keep track of what data is out there.

Don't scrimp on training

Another trend that remains unchanged is the need for trained and talented people. The computer industry has always been plagued with snake oil salesmen offering users products that provide "freedom at last." "This package," they promise, "will release you from the shackles of your glacial MIS shop."

The fourth-generation language that can design and build an application on its own has not been invented. There are doubts it ever will be. Sad tales of those who try to substitute software for training abound. Take, for example, the case of a national convenience store chain.

Two years ago, the firm was said to have poured more than $3 million into an effort to place point-of-sale devices into its 4,000 convenience stores. But the project had to be abandoned because the company lacked an internal data collection infrastructure.

It neither trained nor assigned personnel to supervise the incoming data flow. It did not build an in-house organization to detect and correct data discrepancies before they grew to an unmanageable size. The company put no one in charge of finding and fixing data-flow bottlenecks. It assigned no unit to teach in-store personnel to use the new equipment. In addition, it held no one accountable for providing hot-line support to field staff needing help.

From the project's optimistic beginning to its head-rolling end, one notion held firm. The company believed that because a vendor provides both software and hardware, it did not need in-house technical expertise.

Point-of-sale devices are the facet of data collection and storage most affected by the micro revolution. The fallacy is that better hardware and software produce strategic data systems. In fact, they do nothing of the sort. Only people — talented, technically trained people — count.

Data definition and design

And these professionals must stay abreast of other important database trends — such as desktop workbenches, expert systems and object-oriented design paradigms — that are changing the way they design and build database applications.

Desktop workbenches running computer-aided software engineering (CASE) products are changing developer environments the same way and for the same reasons PCs are proliferating among users. Developers continue to be paid to design, document, compile, link-edit and debug applications. But developers can do it cheaper and faster with a PC.

Expert systems can improve both the durability and feasibility of our designs. They could become automated assistants, primed with dozens of standard data models and rules that let users know when to use them.

But CASE tools and expert systems are merely the MIS versions of developments happening in all technical and engineering fields. Two advances, however, are unique to the craft of application development: new data types and object orientation.

For years, developers were limited to defining fields of only two types — letters and numbers. Newer tools let them define key words for the right-hand side of picture clauses. Many

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development workbenches, such as languages and compilers, now come with built-in data types for high-resolution pictures and digital sounds.

Object-oriented DBMSs benefit both developers and database administrators. For developers, they offer more adaptable, and hence more durable, applications. Object-oriented data access commands need not name the record type to be manipulated.

Instead of invoking one of several validation routines depending on whether an incoming transaction is for a new vendor, invoice, payment or purchase order, a payables application would tell the new record, whatever it may be, to validate itself. The code to do so is reminiscent of IDMS's LRF, because it is part of each entity's definition. But unlike LRF, each record type involved need not have been defined when the program was compiled. In other words, a program can manipulate newly invented record types by invoking their internal logic without having to be recoded or recompiled.

For data modelers, object-oriented DBMSs solve the entity granularity problem. Should vendors and employees be modeled as two relations because most programs, such as purchasing and payroll, deal with one or the other? Or should they be dealt with as one base table with a flag to distinguish flavors, because other programs, such as payables expense reimbursement, treat them as the same thing? Programs using the generic term "payee" could access both as one relation (truncated to only common fields), while those using the specific terms "employee" and "vendor" would retrieve them as different tables. A less trivial use would be for general ledger journal entries.

Object orientation shows that the database pendulum's swing from process- to data-driven design has not yet peaked. Twenty years ago, data-driven methods were on top, pioneered by British programmer Michael Jackson. By 1978, they had been replaced in popularity by Ed Yourdon's process-driven methods. Data-flow diagrams replaced data structure diagrams, except in information modeling.

THE GOOD news is that data-driven applications are rugged and long-lasting.

Today, data-driven approaches are coming back. Planning methodologies such as the Business Information Analysis and Integration Technique, or BIAIT, originated by Cambridge, Mass.-based consultant Donald Burnstine, are said to be replacing methods such as Softech, Inc.'s Structured Analysis and Design Technique, or SADT, for long-range planning.

Developers are learning that it is more important to capture a user's entities than procedures. They should derive on-line screen designs directly from data designs, disregarding the user's business transactions.

The good news is that data-driven applications are rugged and long-lasting. Business procedures change, data entities do not. The bad news is that they may seem unfamiliar to users accustomed to having every idiosyncratic procedure automated. But desktop dispersal has increased user computer literacy, making data-driven's strength

SCIENCE/SCOPE®

Giant helium-filled balloons were used to deploy two large antenna reflectors on the Intelsat VI spacecraft during testing. The balloons are used to offset gravity and simulate the weightlessness of space. When in space, the antennas will be able to unfold on their own. Hughes Aircraft Company is building five Intelsat VI spacecraft for the International Telecommunications Satellite Organization. Each satellite will be able to carry 120,000 telephone calls and three television transmissions simultaneously. The first launch of an Intelsat VI, the world's largest commercial communications satellite, is scheduled for 1989.

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more valuable and its weakness less distasteful. The advent of object-oriented programming takes the data-driven approach one step further — right down into the coding.

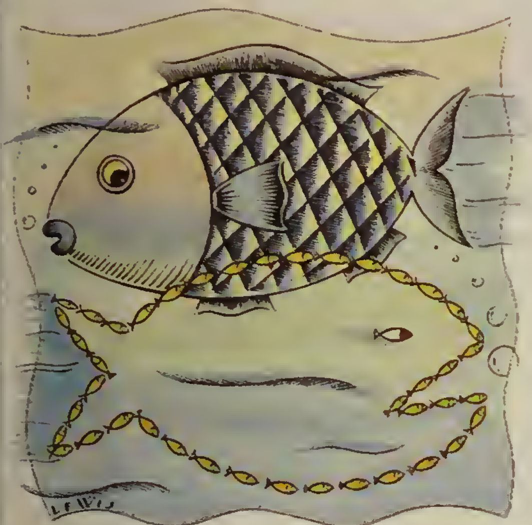
Object functions are being added to existing languages. They are now available in Pascal, C, LISP and Ada. Pushed by market pressure, Cobol and Cullinet's ADS/Online cannot be far behind. One vendor, Artificial Intelligence Corp. in Waltham, Mass. — whose chief executive officer, Bob Goldman, is a past president of Cullinet and author of the company's IDMS/DC — uses an underlying object-oriented design paradigm to drive an entire expert system development environment called the Knowledge Base Management System.

But what will object-oriented technology mean to MIS managers?

First, because programs can invoke objects that were not even imagined when the programs were written, Brad Cox, author of the book *Object-Oriented Programming: An Evolutionary Approach,* says the technology will create a commercial market for objects, similar to the semiconductor chip market that arose once interfaces were standardized.

In a few years, there may even be advertisements for a talking vendor record or a faster general-ledger transaction. Invoker and object need not have been written in the same language. To use an alien object, developers merely need a list of its methods or subroutines and what they do.

Second, code sharing will become more widespread. Because action details are within objects, not mainlines, developers can, for example, build a single generic Macintosh dialogue with a single record occurrence at screen top and multiple related subordinates scrolling at screen bottom and use it for every interrecord set in every application as a default archetype. Developers need never recode or recompile the dialogue just to use it with newly invented records.



Finally, there should be another round of scrambling for position on the organizational turf boundary between developers and data administrators. Who designs a new object? Its data and logic are too intertwined to disentangle. If it is developers, how can we safeguard data-naming conventions? If it is data administrators, how can we avoid moving programming into data administration? The answers are not obvious — the latter issue is precisely what is stifling IDMS's LRF today.

The new generation of databases will merge features from mainframes, minis and micros. They will emerge from a shotgun wedding of MIS and PC techniques. Each side will bring an important gift to seal the union:

- **Something old.** Concurrency locking and transaction journaling — rollback, two-stage commit — have been around for decades. Oddly enough, little file server software has provided these capabilities because most network applications have not supported multiuser environments. Vendors of servers lacking these features are working to add them. Digital Equipment Corp., Apple, Sybase, Inc., Ashton-Tate and Microsoft Corp. are expected to enhance their server offerings in the near future.
- **Something new.** In addition to the heterogeneous connectivity demanded by users, another new concept has become central to tomorrow's database scenario: interface metaphors, setting the look and feel of the end users' screen displays. How should they copy a file from one disk to another? Should they type something like "COPY A:xxx.yyy, B:" on their keyboards or drag the file's icon from one disk icon to the other with a mouse? The issue may seem trivial. It is not. Differences in the cost of learning alone can buy a few more workstations. It is no accident that IBM and Microsoft's OS/2 has adopted the same mouse-graphic-point-click approach that the Macintosh borrowed from Xerox Corp.
- **Something borrowed.** One feature of emerging data techniques, the standard communications protocol, is being adopted from overseas. DEC's Decnet, Apple's Appletalk and IBM's LU6.2 and Systems Network Architecture (SNA) are vying for market share.

With the exception of SNA, they are all converging under the International Standards Organization's Open Systems Interconnect umbrella.

- **Something Blue.** SQL.

The fact that trends are being deflected by unexpected developments is nothing new. The computer industry has a long tradition of shifting goals that become unprofitable. Recall that "database administration," in contrast to data administration, once meant naming standards and information modeling; today, it means software support. "Relational" once meant lacking explicit interrecord relationships; today, it means enabling them to exist. And remember that Cobol, according to the charter of the committee that invented it, was once the epitome of end-user programming. •

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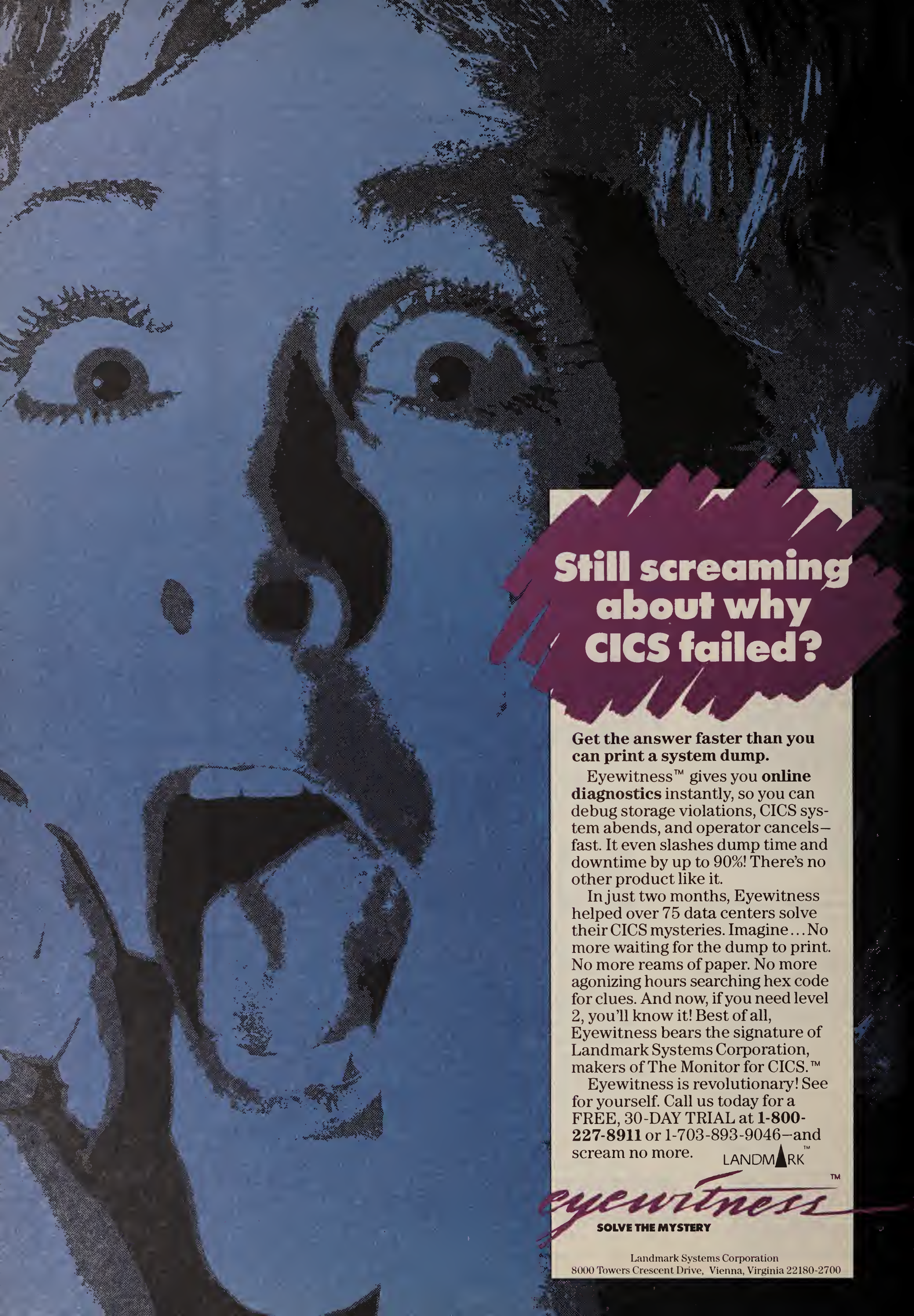
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TAKING CHARGE

James Connolly

Catch the MIS waves

Take an entry-level course in data processing — the type that liberal arts majors use as an elective during a respite between seminars of fun stuff, like the impact of religion on art during the Renaissance — and one of the first lessons deals with the several generations of computers. The lesson details a fairly clear-cut progression from vacuum tubes to transistors to integrated circuits to large-scale integrated circuits.

But those generations relate only to the core technology of the computers. It is becoming clear that how computers are used, even how they are used in specific industries, is going through generational cycles, cycles that may trail the computer generations by many years. The challenge for information systems executives is to recognize those cycles and their impact on a company. If managers spot those trends, they can know when to commit their resources or hold back and when to pull rabbits from their hats to win the corporate political backing to hammer an emerging technology into a money-making system.

Just as with the computer generations, the gaps between implementation generations are filled with lesser development and incremental enhancements. However, a look at a few

Continued on page 93

DEC's Cross works IS balancing acts

BY JAMES CONNOLLY
CW STAFF

Many of the challenges in Belford E. Cross' job involve maintaining a balance.

His 6,000-employee information systems organization is decentralized, with decision making handled at the 450 Digital Equipment Corp. sites. Freedom of choice is kept in check by a centralized committee. His users want local processing power but also IS support. He wants IS personnel to understand business issues but also wants them to keep up with technology.

Cross, DEC's corporate manager of Digital Information Systems, oversees the 6,000-person worldwide IS group, which supports more than 100,000 terminals, personal computers and other devices. But only 400 workers, primarily in training and network management, report directly to him. The others do so on a dotted-line basis.

In discussing challenges — some of which face all IS executives and some specific to high-technology companies such as DEC — Cross says, "Probably the No. 1 challenge is implementing the decision that we made as a company that information is a free-flowing element of Digital doing business."

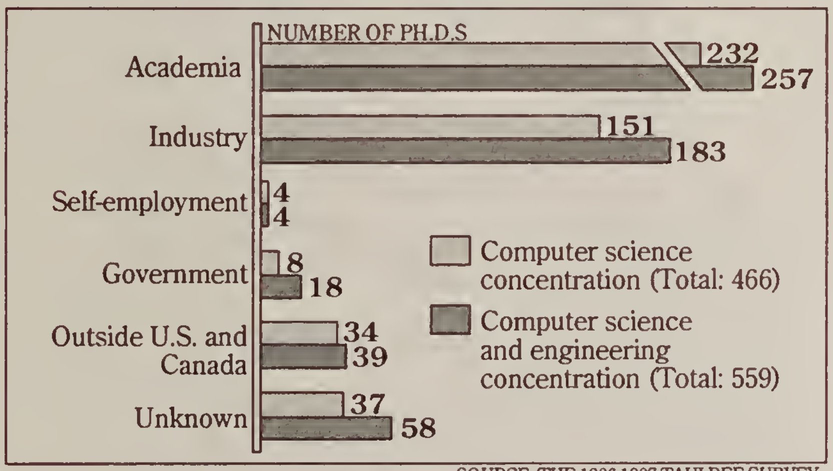
He cites the example of DEC's electronic mail applications. About 84,000 of DEC's 121,000 employees have access to E-mail, and the rest can use it through public terminals. E-mail supports a conferencing system through which all employees can share information about subjects such as world travel, but it also supports conferences for limited numbers of employees who exchange information on product development or strategy. It is Cross who is ultimately responsible for ensuring that network

Continued on page 94

Data View

Ph.D.s go back to school

Most Ph.D.s in the computer sciences choose academic careers over positions in the corporate world



SOURCE: THE 1986-1987 TAULBEE SURVEY, ASSOCIATION FOR COMPUTING MACHINERY, INC.
CW CHART

PROFILE

Belford E. Cross

Position: *Corporate manager for Digital Information Systems at DEC.*

Philosophy: *The job of the IS group is to offer two or three standardized options to local IS and business groups, which work together to choose the solution that is right for them.*

Hotels, agents get link

Reservation systems united through switch

BY ALAN J. RYAN
CW STAFF

Within a year, travel agents may be able to sit at their computer terminals and switch directly through the airline reservation systems they use today into the reservation systems at hotels across the country.

Called Ultraswitch, the communications system being built is a joint development effort of nine hotel chains and Murdoch Electronic Publishing, Inc. (MEP).

The Ultraswitch system will link the airline systems that most travel agents' terminals are hooked into to the nine hotel chains. The travel agent will then be able to switch through the airline computer directly into a hotel chain and receive immediate confirmation of the room reservation, explained Jerry Pettit, executive vice-president and chief operating officer of Quality Inns International, Inc. in Silver Spring, Md.

A few airline reservations systems now include some hotel reservation capabilities, but these are gerrymandered systems designed to handle airline seat reservations, said a spokeswoman at Marriott Corp. in Bethesda, Md. "The hotel room sale is a lot more complex than an airline seat sale."

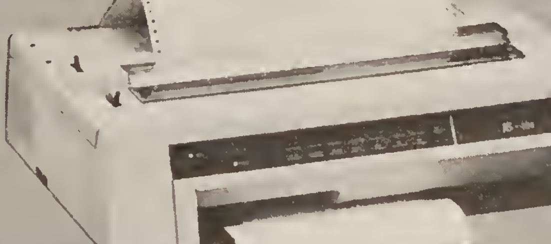
The Ultraswitch project had been under study by the Hotel Booking Research Association for more than a year, said Robert D. McGrail, chairman of The Hotel Industry Switch Co. (Thisco), a corporation formed last month to bring the project to life.

McGrail is also senior vice-president of participating hotel chain Days Inns of America.

The system is expected to be up and running by the middle to the end of 1989.

The software for the project is being developed by Anasazi, Inc. in Phoenix. Tom Castleberry, president of Anasazi, said

Continued on page 93



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CALENDAR

DEC. 4-10

Strategic Issues In Managing Information Technology. Cambridge, Mass., Dec. 5-7 — Contact: Decision Support Technology, Conference Registration Office, 51 Church St., Boston, Mass. 02116.

The New Tools — Computer Graphics For Design/Fall 88. New York, Dec. 4-7 — Contact: Pratt Center for Computer Graphics in Design, 45 Stephenson Terr., Briarcliff Manor, N.Y. 10510.

MFOC '88-West: Military Fiber Optics Conference. Los Angeles, Dec. 5-8 — Contact: Information Gatekeepers, 214 Harvard Ave., Boston, Mass. 02134.

CASE Expo Fall. Anaheim, Calif., Dec. 5-9 — Contact: Case Expo Fall Coordinator, Suite 1210, Two Skyline Place, 5203 Leesburg Pike, Falls Church, Va. 22041.

New Developments In Image Processing. New York, Dec. 6 — Contact: Brandon Managing Information Programs, One Harmon Plaza, Secaucus, N.J. 07094.

Fiber in the Subscriber Loop. Burlingame, Calif., Dec. 6-7 — Contact: Lightwave, 235 Bear Hill Road, Waltham, Mass. 02154.

In-House Document Preparation, Processing and Printing Conference. New York, Dec. 6-7 — Contact: Expocon Management Associates, 3695 Post Road, Southport, Conn. 06490.

ISDN Comforum. Orlando, Fla., Dec. 6-7 — Contact: Comforum, Suite 740, 303 E. Wacker Drive, Chicago, Ill. 60601.

AEC Expo. New York, Dec. 6-8 — Contact: Expoconsul International, 3 Independence Way, Princeton, N.J. 08540.

Infomatics 88. Hong Kong, Dec. 6-8 — Contact: International Information Management Congress, 345 Woodcliff Drive, Fairport, N.Y. 14450.

The Macintosh in Corporate America. Santa Clara, Calif., Dec. 7 — Contact: International Data Corp., 5 Speen St., Framingham, Mass. 01701.

Knauer DB2 Users Group and the Data Administration Management Association Meeting. IBM's Repository-Based CASE Tools, SQL Cooperative Processing and Merging AI and Relational Technologies. New York, Dec. 8 — Contact: Knauer DB2 User Group, Sixth Floor, 220 Fifth Ave., New York, N.Y. 10001.

Preparing For ISDN: Business Implications of a Technical Revolution. Toronto, Dec. 8-9 — Contact: Angus Telemanagement Group, Suite 3, Office Mall Two, 1400 Bayly St., Pickering, Ont. L1W 3R2.

DEC. 11-17

National EDI Systems Conference and Exhibit. Washington, D.C., Dec. 13-14 — Contact: J. L. Dreyer, TDCC, 1101 17th St. N.W., Washington, D.C. 20036.

CMG '88 International Conference. Dallas, Dec. 13-16 — Contact: General Chairman, CMG '88, CMG Headquarters, 6397 Little River Tnpk., Alexandria, Va. 22312.

Retail Delivery Systems Conference. Nashville, Dec. 11-14 — Contact: Bank Administration Institute, 60 Gould Center, Rolling Meadows, Ill. 60008.

Winter Simulation Conference. San Diego, Dec. 12-14 — Contact: Peter Haigh, NCR Corp., SER Building, 1700 S. Patterson Blvd., Dayton, Ohio 45479.

1988 Winter National Design Engineering Show. Anaheim, Calif., Dec. 13-15 — Contact: Show Manager, Winter National Design Engineering Show, 999 Summer St., Stamford, Conn. 06905.

Global Networking: A New World of Information. New York, Dec. 15-16 — Contact: The Yankee Group, 200 Portland St., Boston, Mass. 02114.

JAN. 1-7

1989 Society for Computer Simulation Western Multiconference. San Diego, Jan. 4-6 — Contact: Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

JAN. 8-14

Enterprise T-1 Networks: Emerging Strategies. Washington, D.C., Jan. 9-10 — Contact: Telecom Publishing Group, Attn: Conference Registrar, P.O. Box 1455, Alexandria, Va. 22313.

JAN. 15-21

National Retail Merchants Association Annual Convention and Business & Equipment Exposition. New York, N.Y., Jan. 15-18 — Contact: NRMA, 100 W. 31st St., New York, N.Y. 10001.

PTC '89, Conference of the Pacific Telecommunications Council. Honolulu, Jan. 15-18 — Contact: Pacific Telecommunications Council, Suite 308, 1110 University Ave., Honolulu, Hawaii 96826.

Computer Graphics New York. New York, Jan. 17-19 — Contact: Exhibition Marketing & Management Co., Suite 1110, 8300 Greensboro Drive, McLean, Va. 22102.

Supercomputing Solutions '89: New Technologies for Super Performance Computing. New York, Jan. 17-19 — Contact: Supercomputing Solutions '89, Suite 1110, 8300 Greensboro Drive, McLean, Va. 22102.

Executive Conference for Corporate Data Processing Managers. New York, Jan. 18 — Contact: International Data Corp., Box 955, 5 Speen St., Framingham, Mass. 01701.

Winter Conference of the National Association of Telecommunications Dealers. Palm Springs, Calif., Jan. 18-21 — Contact: NATD, 1255 23rd St. N.W., Washington, D.C. 20037.

Theirs.

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Hotels

FROM PAGE 91

he expects the software to be Unix-based, but McGrail said those decisions have not been finalized yet.

MEP is providing much of the up-front money for the $8.5 million project. MEP, which publishes several travel industry-related publications, is providing $4 million to cover the software development costs, McGrail said, and will provide another $4 million as a startup fund loan.

McGrail added that Ultraswitch would ultimately be able to connect to any electronic reservation system in any given industry.

While Thisco will own the switch and the software, "We've agreed to license that technology to Murdoch if they wish to use it in other fields," McGrail said. "Our only concern is to reserve for this company all the rights for use of the switch in the lodging industry worldwide."

Hotels involved represent approximately 750,000 hotel rooms and include Best Western International, Days Inns, Hyatt Corp., La Quinta Motor Inns, Inc., Marriott, Quality Inns, Inc., Ramada, Inc., The Sheraton Corp. and Trusthouse Forte Hotels.

Several other hotel chains are expected to pay the one-share fee of $50,000 to become stockholders by the end of the month, McGrail said.

Once the switch becomes functional, it will be open to any hotel company that can technically use it on a transaction-fee basis.

Airline systems that Ultraswitch will be able to work with include American Airlines' Sabre, United Airlines' Apollo, Texas Air's System One, Trans World Airlines' Passenger Airline Reservation System, or PARS, and Delta Air Lines' Delta Automated Travel Account System 2, or DATUS.

Connolly

FROM PAGE 91

industries shows where the generational waves appear.

In the travel industry, the early and mid-1970s saw the debut of reservation systems for airlines and hotel chains. The wave started with a few pioneers and gained strength for a few years before American Airlines changed the rules by giving travel agents terminals for access to its Sabre system. It marked a new generation and a new set of rules for competitors to follow.

Now, the travel industry is moving into another generation as airline, hotel and car rental companies are teaming up to make the most of transaction processing, database management and network management systems and to convert the type of decision-support and target-marketing capabilities exhibited by the airlines into standard tools for all travel companies.

Food scanners

In the food industry, checkout scanners became standard equipment for grocery stores only a few years back. They speeded checkouts and provided manufacturers and store chains with a decent database on which to base sales tracking.

Since then, there has been incremental progress and a lot of talk about the industry of the future. But suddenly, when one talks to IS managers in either the retail or the manufacturing end of the food industry it becomes apparent that handheld computers such as those used by Frito-Lay and L'eggs salespeople are bound to become standard equipment within a year or so, and electronic data interchange could become an everyday reality almost as fast.

The keys to catching the generational wave in any industry are recognizing what a technology can do, knowing whether the technology will change so drastically in a few years so as to make the initial equipment obsolete and — perhaps of greatest import — knowing whether employees, customers and the organization are ready to do business in a new way.

Connolly is *Computerworld*'s senior editor, management.

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HEWLETT PACKARD

DEC's Cross

CONTINUED FROM PAGE 91

traffic for public conferences is kept to off-peak hours when possible and that access to private business conferences is kept private.

"When you get into the business content, you start being concerned about how you manage it and who needs the information to do their job. One of the big challenges of any IS manager today is maintaining security — security of proprietary information and security of your intellectual property," Cross says.

Cross lauds the benefits of E-mail and conferencing, including reduced use of telephones. "The key benefit to the company is shorter lead time to make decisions, the ability to coordinate groups of people who are in different geographies. When you get into an engineering design of a product set, you can share the design base between the engineering group and the manufacturing group that is going to build it. The manufacturing engineers can look at the design as it is progressing and produce electronic mail messages back that say, 'Gee, if you design it this way we can build it better.' So we are starting to get producibility back into the earlier phases of the design process, and the goal is to get a quicker time to market."

But moving information such as product designs through the network means Cross has to deal with growing needs for bandwidth, even though he says Ethernet and DEC's T1 and fiber-optic cable backbones have substantial bandwidth. Two years ago, DEC appointed a bandwidth manager whose mandate is to educate people about using the 32,000-node DEC network effectively.

The worst errors

"Yes, the No. 1 error one could make would be to run out of bandwidth, but a very close second is to use the bandwidth incorrectly and not be cost-effective," Cross says. Rather than depend on the end users to use the network effectively, DEC wants to build effectiveness into the application itself. Cross cites the example of how databases should be updated by sending only changes, not the full database, across the network.

"The challenge is in the education of the IS people building the applications and working with the users who are designing the specification of the business process," Cross says.

Cross, as an IS manager within a computer company, says control of technology's use comes through two primary steering committees, one of which consists of mostly business representatives and one made up of company IS executives. Those committees look at issues such as which processes should be automated and which technologies should be standards. The nine-member Digital Information Systems Management Committee is the IS group that sets standards, thus ensuring that IS officials who implement technology in partnership with local business managers have input into the standards process.

"I think one of the challenges for any technology company is to not get too wrapped up in the technology itself and forget that your prime purpose is to support the business. You don't put technology in because it is exciting, you put it in because it has a business purpose," Cross adds.

> "ONE OF THE things I'm excited about is keeping the technical edge. . . . We are rebuilding the emphasis on being current on the technologies."
>
> BELFORD E. CROSS
> DEC

Cross, a mechanical engineer who rose through plant management and planning at DEC and took the top IS job four years ago, has seen the users' technological knowledge level change through the years, with a mix of benefits and pitfalls.

"They are much more demanding, but because they are much more aware of technology they are much easier to work with. There is a higher level of understanding on why it is important to get the specification right for a particular application and what it is going to mean once the application is built," he says. He also tells how many users who demanded responsibility for their own processing power now ask for IS' help in systems management tasks such as backups and contingency planning.

He says DEC's IS group has restructured slightly, shifting its focus from individual technologies, such as communications equipment and computers, to one that looks at common functions and issues. He also cites a shift in what is expected of IS people.

"One of the things I'm excited about is keeping the technical edge. There has been a lot of hype — and much of it very valid — around getting our IS people to be more business oriented: They have to begin to understand the business, etc. But I think that has moved the IS function in most companies and in Digital to a place where we put a lot of emphasis on that.

"But we are rebuilding the emphasis on being current on the technologies," he continues, "because now that we have become more knowledgeable about the business, there are new ways we can use the technologies that were not visible before."

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COMPUTER INDUSTRY

INDUSTRY INSIGHT

Charles Varga

Merger ups and downs

The dictionary defines "post-mortem" as "occurring after death" or "following the event; appraisal of the game."

Aren't definitions fun? When it comes to computer industry mergers and acquisitions, I much prefer the second meaning. I don't wish to imply that an acquisition or merger should be equated with death, but rather my intent is to appraise the great game following the blessed event.

Last year, Vanguard Atlantic and I completed a research project on the success or failure of acquisitions and the reasons for same. Here is what we found:

- Who initiated the acquisition had little or no significant effect on the acquisition's success or failure. However, buyers and sellers agreed that acquisitions initiated by an intermediary were less successful than those initiated by the buyer or seller himself.
- A total of 76% of our seller participants graded the overall success of their sell-offs as winners. Buyers followed suit, with a total of 72% indicating that

Continued on page 97

Can Apollo get back on track?

Workstation pioneer aims to rewrite script; analysts skeptical

BY NELL MARGOLIS
CW STAFF

"Right timing is in all things the most important factor."
Hesiod (c. 700 B.C.)

CHELMSFORD, Mass. — Even before the birth of Christ, it seems, people knew what Apollo Computer, Inc. is now finding out. In the early 1980s, the company, based here, virtually invented the now-sizzling workstation market. That may have been the last time Apollo didn't have a problem with timing.

According to Apollo executives, the next time is about to come. Industry and market analysts, however, remain dubious. They cite precarious times in the computer industry in general, the unforgiving nature of the hotly competitive workstation segment in particular and Apollo's crippling loss of momentum over the past several years.

Instances of unfortunate Apollo timing are legion. "Apollo had super technology and good marketing," said Charles Foundyller, president of Daratech, Inc., a market research firm in Cambridge, Mass. "Unfortunately, Sun came along with super technology and unbelievable marketing. Apollo was fighting trench warfare when Sun came along with the blitzkrieg."

The comeback kid

Apollo's Gallup

Now, once again, Apollo seems poised for a possible comeback. Vaunted new product entries — Domain/OS, the company's distributed Unix operating system; the reduced instruction set computing-based DN 10000 personal supercomputer; and the Series 4000 low-end workstations — have recently begun shipping to commercial customers and have been well received by industry analysts.

On the financial front, earnings and profits for the company's third fiscal quarter ended Oct. 3 were marginally better than analysts had expected.

"Over the past two years, we've come from a proprietary system to a very open system, and from a one-product line to a full line," noted Chief Financial Officer Richard Bond. Added David Nelson, Apollo's vice-president and a cofounder, "We're very fortunate to have the product strength we do. Our transition is largely behind us."

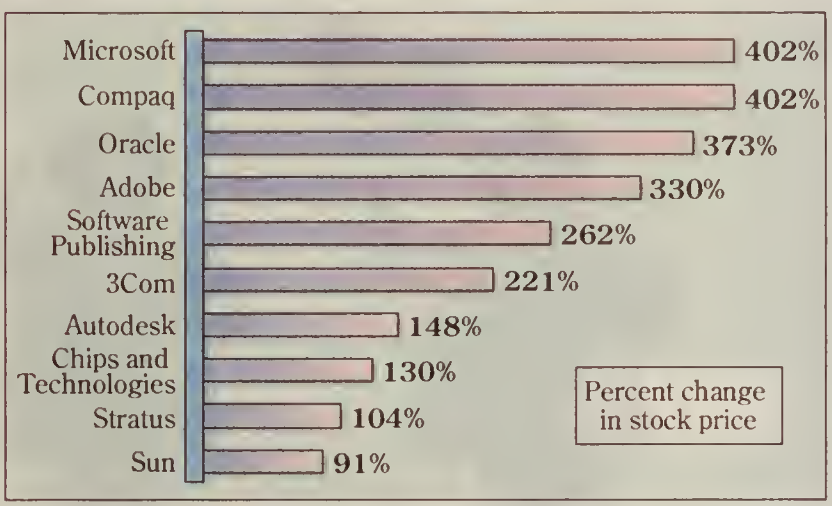
But is it? Many observers said the hardest — maybe impossible

Continued on page 96

Data View

High-tech's greatest hits

Best-performing computer stocks that went public in the last five years, based on increase from initial offering to Oct. 19, 1988



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Fed panel: Aim high in R&D

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The "grand challenges" for the computer industry include the development of an ultrareliable computer that could run 20 years without failing and an ultracomputer that performs a trillion operations per second, according to a National Research Council panel.

The council's Computer Science and Technology Board, in a report on the future of computer science and technology released earlier this month, said computer research needs to be organized around several grand challenges facing the industry, including the ultrareliable computer and the ultracomputer.

Other research projects recommended by the panel, chaired by Joseph Traub, professor of computer science at Columbia University, include the following:

- Computer systems that learn from practice, observation or textbooks.
- Nationwide computer networks with increased productivity.
- Computers that can learn how to assemble appliances on the factory floor.
- A translating telephone system that allows people speaking different languages to converse directly.
- Self-replicating systems that can build and assemble factories in space using raw materials from planets and asteroids.

Purse-string woes

Progress in these areas is theoretically possible, the board said, but it is not clear whether the advances will be achieved because of inadequate research funding.

"The U.S. position in this field is threatened from without by external competition and from within by underappreciation of the need for basic research," the board wrote.

Government funds have played a key role in America's "unique innovation engine" in the past, but government research funds at the Defense Advanced Research Projects Agency and the National Science Foundation are growing scarce and are directed at projects with short-term applications, the panel said.

Bush to urge open but fair trade with Japan

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — President-elect George Bush will push for a trade policy of open borders but will also insist on fair trade, according to Gilbert B. Kaplan, former deputy assistant secretary of the Import Administration at the U.S. Department of Commerce.

"Bush will continue the Reagan policies but will take a more pragmatic approach," Kaplan said at a recent Tokyo press conference. He added that Bush will more strongly enforce fair trade practices because the president-elect has had business experience at a Texas company, while President Ronald Reagan had no such experience.

Kaplan noted that the new omnibus trade bill has moved a lot of jurisdiction from the president to the U.S. Trade Representative's office "so trade can be handled as a business, as it should be . . . without turning into a major foreign policy issue."

According to Kaplan, Bush will have five trade solution options from which to choose in solving U.S.-Japan trade disputes:

- Tough bilateral sectoral negotiations, as were concluded in the semiconductor and steel markets.
- The new Super 301 clause in the omnibus trade bill that permits the president to negotiate across all market sectors with a country that is specified for priority trade liberalization.
- Setting up a free-trade zone.
- Working a trade accord across the entire Pacific Rim.
- Letting the problem run its course and dissipate.

Hear no evil

Ironically, despite the loggerheads reached in several major trade issues now, Kaplan said trade was not a big issue during the U.S. election campaigns. "People don't want to hear protectionism in a campaign," he said. "The American economy is so interdependent on the world economy now. Most people do not want to interfere with trading."

U.S. import and export activities account for some $800 billion in business and millions of U.S. jobs, he added.

But U.S. Representative Richard A. Gephardt (D-Mo.), who focused on trade issues but ended up dropping out of the U.S. presidential race early on, said that trade and economic issues should move into center stage on the new administration's agenda.

"We need a trade policy that is unified and coherent," Gephardt said at another Tokyo press conference. "It shouldn't be the latest complaint from American industry that carries the day." He added that he expects the Bush administration to replicate Reagan's current policies. "I don't expect a big difference in practice and policy from that of the last few years."

Gephardt, who has been feared by Japanese government and industry for his authorship of

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Apollo

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— transition is yet to come: The repositioning of the company as a winner.

"Once you begin to be seen as a loser, you're in trouble deep," said Richard Shaffer, president of Technologic Partners, a New York-based computer industry consulting and research firm. Today's workstation customers, Shaffer said, have been sold on the concept of openness — and on the image of Apollo as a vendor of proprietary products.

"Apollo is gradually getting more and more open, and there's plenty about Sun that isn't," he said. "Perception might not be reality, but it's what makes customers do what they do."

The problem has not gone unnoticed in Chelmsford. "Over the next year, my biggest worry is getting out there and changing our image," said Michael Gallup, Apollo's acting vice-president of marketing. "That's the challenge, that's the concern, that's the frustration."

According to Gallup, the company has increased its sales and marketing head count by some 35% over the past year. The newly strengthened marketing force, he said, is actively going after a broad range of new markets — in many cases, customer bases available to Apollo for the first time thanks to the past year's technological developments.

The effort, however, could be too little too late. With players like Digital Equipment Corp. and Hewlett-Packard Co. to contend with and personal supercomputers from the likes of Stellar Computer, Inc., Ardent Computer Corp. and Silicon Graphics, Inc., the workstation market is a fast court, where catch-up ball is not easy to play.

But the competition eclipsing Apollo, analysts also agreed, is still Sun Microsystems, Inc. "Even matching Sun in marketing wouldn't be enough," Foundyller said. "Apollo has to beat them."

"I don't think Apollo will recover," Shaffer said. "I think it's more likely that Sun will blow it. That's got to be what Apollo's hoping for — that Sun's wings will drop off and Apollo will be standing there, waiting with its good technology, ready for the market to return."

IN BRIEF

VM to buy DB View

Just in time for Thanksgiving came the news that Reston, Va.-based **VM Software, Inc.** and Waltham, Mass.-based **DB View, Inc.** are talking turkey. VM Software signed a nonbinding letter of intent to acquire substantially all of the assets of DB View, a privately held purveyor of products to be used with IBM's DB2 relational database management system. Terms were not disclosed. The common pursuit of SQL/DS and DB2 toward complementary ends, according to VM Software Senior Vice-President Pamela McFarland, recommends the marriage, which is expected to take place in early 1989.

. . . .

Coleman at helm

Bruce Coleman, two-time former chief executive officer of IBM mainframe systems software vendor Boole & Babbage, Inc., last week became the new president of Montvale, N.J.-based human resources management systems software house **Information Science, Inc.** Coleman oversaw a period of sustained growth at Boole & Babbage in the 1970s; under his second stewardship, from 1986 to 1988, the company recovered from a loss period. In 1985, he served as CEO of financial software vendor Walker Interactive Corp. during that company's financial turnaround.

. . . .

DEST cuts 70 jobs

With heightened losses and lower sales projected for the current quarter, Milpitas, Calif.-based text and graphics processing company **DEST Corp.** has trimmed 70 employees from its work force, reducing total head count to 135. The move followed closely on DEST's announcement of a major promotional price cut. According to company President Chris Kenber, the attempt to serve stockholders will not end here; the board of directors is also looking into the possibility of additional financing and joining forces with strategic partners.

. . . .

All's well at Dell

While many personal computer clone makers have seen profits slip recently, **Dell Computer Corp.** kept pace with market leader Compaq Computer Corp. in growth rates in its third quarter ended Oct. 28. The Austin, Texas-based manufacturer reported that earnings increased 60% to $5 million, or 26 cents per share, on sales that surged 83% to $75.2 million. The company cited strong sales to large corporate accounts, value-added resellers and the international marketplace. Dell added West German and Canadian subsidiaries during the quarter and said overseas sales accounted for 14% of its revenue.

Varga

CONTINUED FROM PAGE 95

their acquisitions were also rated as winners. Not a bad track record. However, 20% of buyers also graded their acquisitions as losers. Following these were 17% of sellers who graded their deals as no-win/no-lose.

- Like an old-time religion seeking revival in fundamentals, merger prophets and acquisition preachers have made much of an old trinity: the right price, strategic fit and good timing. Although any one of these attributes could make or break a deal, almost 70% of our survey respondents indicated price to be the principal and highest rated factor.

But the combination of the right price and strategic fit means more in terms of perceived success. Conclusion: Price alone doth not a happy marriage make.

- There is a generally held perception in our industry that the more deals you complete, the better you become at it, therefore achieving a higher level of success in these subsequent transactions. It ain't necessarily so!
- Buyers with the highest success ratings were those who acquired a company to extend their market and round out their product lines. This group was followed closely by firms that acquired a competitor.
- If there is one thing an acquisition brings, it is change. The single largest response by buyers (52%) indicated that they extended product range by adding new products. This was followed by 48% who indicated changes in senior management staff, 38% noting that they divested products and 34% saying they made changes in the sales staff.

> PRICE ALONE doth not a happy marriage make.

Sellers perceived a slightly different set of changes. Alterations in senior management and sales staff were recorded by 38% of our survey participants. Changes in senior technical staff came in at 28%, followed by the addition of new product at 24%.

- Buyers and sellers agreed that an increase in the number of employees in the successor business unit after the acquisition was a positive measure.
- Strategic direction was the single most important factor rated similarly among buyers and sellers and was also felt to have one of the strongest positive impacts on acquisition success. Technology played the next major important role; management styles came in third when rated by sellers.

Similarities in customer base placed fourth. Corporate cultures and relative size received low scores; their impact on acquisitions was seen as mixed. Differences in corporate culture showed stronger negative impact on deals.

Form of the transaction and acquisition terms received the highest response levels, although not the highest success ratings as measured by total grade point score. Price is nice, but fit is better. Geographic proximity was rated as having a positive impact on acquisition success. Long-distance marriages are not impossible, but they do require extraordinary measures to guarantee success.

Post-acquisition management was another area that buyers and sellers basically agreed had a positive impact on acquisition success.

- To integrate or not to integrate, that is the obsession. Participants who indicated they did not integrate rated the acquisition as slightly successful. However, those who did integrate were very successful. Obviously, integration appears to be one of the keys to success.
- Finally, acquisitions and mergers are complex relationships. There are no easy recipes or formulas for success.

Varga, a 20-year computer industry veteran based in Frenchtown, N.J., is publisher of "The Cerberus Report," a study of mergers and acquisitions.

Bush

CONTINUED FROM PAGE 95

the original 301 clause in the new omnibus trade bill, said he is not protectionist. Still, he advocates using U.S. trade laws to their fullest. "I'm adamant about reciprocity and fair trade. But I understand it takes time, understanding and sensitivity," he said.

He particularly advocates carefully monitoring the progress of the effect of the new omnibus law on trade practices. "This bill makes an important down payment on revitalizing the U.S.' trade position in the world economy by updating the rules and the tools that are used in trade relations. Much will depend on how those rules and tools are used in the future," he said.

Gephardt pointed to the failure of the U.S. government to adequately monitor progress of the U.S.-Japan Semiconductor Agreement and make sure Japan was meeting its commitments. "We can no longer afford to reach agreements without identifiable goals," he said.

Gephardt said that three primary barriers remain in Japan: political, bureaucratic and private-sector ones. "The barriers to foreign products are pervasive in nature and often difficult to identify," he said, because they are hidden.

Tariffs are generally not a problem in Japan, where they are among the lowest in the world.

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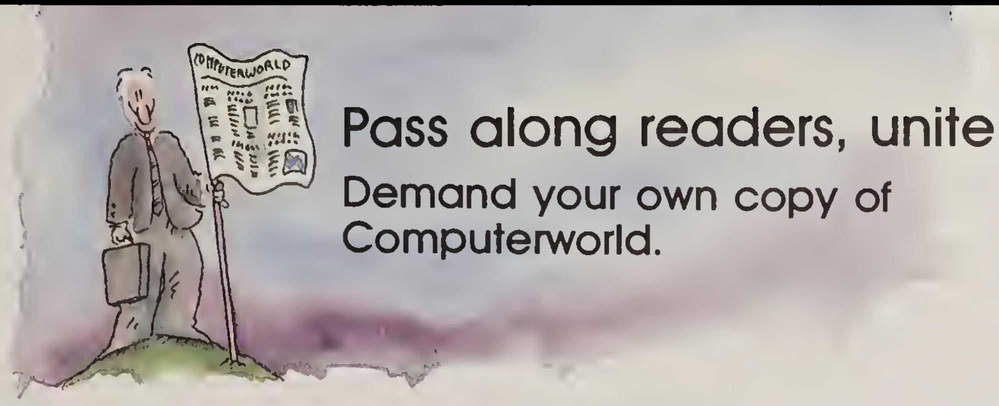

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   - **50.** Business Service (except DP)
   - **60.** Government — State/Federal/Local
   - **65.** Communications Systems/Public Utilities/Transportation
   - **70.** Mining/Construction/Petroleum/Refining/Agric.
   - **60.** Manufacturer of Computers, Computer-Related Systems or Peripherals
   - **65.** Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
   - **90.** Computer/Peripheral Dealer/Distributor/Retailer
   - **75.** User Other ______________________
   - **95.** Vendor Other ______________________

   (Please specify)
2. **TITLE/FUNCTION** (Circle one)

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   - **19.** Vice President, Asst. VP
   - **21.** Dir., Mgr., Suprv., IS/MIS/DP Services
   - **22.** Dir., Mgr., Suprv., of Operations, Planning, Adm. Services
   - **23.** Dir., Mgr., Suprv., Analyst, of Systems
   - **31.** Dir., Mgr., Suprv., of Programming
   - **32.** Programmer, Methods Analyst
   - **35.** Dir., Mgr., Suprv., OA/WP
   - **36.** Data Comm. Network/Systems Mgt

   OTHER COMPANY MANAGEMENT
   - **11.** President, Owner/Partner, General Mgr
   - **12.** Vice President/Asst. VP
   - **13.** Treasurer, Controller, Financial Officer
   - **41.** Engineering, Scientific, R&D, Tech. Mgt.
   - **51.** Sales/Mktg. Mgt.

   OTHER PROFESSIONALS
   - **60.** Consulting Mgt
   - **70.** Medical, Legal, Accounting Mgt
   - **60.** Educators, Journalists, Librarians, Students
   - **90.** Others ______________________

   (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant
   - A. Mainframes/Superminis
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems
   - F. No Computer Involvement

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COMPUTER CAREERS

Shopping guide for retail posts

Mergers currently churn job market, but long-term demand looks strong

BY ALAN RADDING
SPECIAL TO CW

Consolidations, takeovers and mergers have dramatically altered the retail corporate landscape and muddied the short-term outlook for MIS professionals seeking careers among the major chains of department stores and mass merchandisers.

Much brighter, however, are the long-term prospects. Systems development in the retail environment will experience "an explosion in the next few years," predicts John Chay, vice-president of information systems at the National Retail Merchants Association in New York.

Even the impact of the consolidations may not be as bad as expected. Zayre Corp., which operates a 392-outlet discount department store chain based in Framingham, Mass., recently was acquired by Ames Department Stores, Inc. in Rocky Hill, Conn. Some of Zayre's MIS workers are likely to be laid off in the consolidation of systems. But according to recruiters, there is considerable MIS hiring continuing at the Zayre Corp. divisions that Ames did not buy; T. J. Maxx and Hit or Miss, Inc. are actively seeking programmers and programmer analysts.

One source says Zayre has not cut back the corporate MIS department and is continuing to create new jobs within divisions. Only additional growth plans for corporate MIS have been curtailed, he says.

Short-term cuts

Still, logic suggests the consolidations will cost jobs in the short term. "It will have to impact the MIS departments," says Lee Silver, president of L. A. Silver Associates, a Framingham, Mass., executive recruiter specializing in high technology. "If two retailers with two separate MIS departments merge, there has to be a lot of overlap," says Silver, who previously was a Zayre executive of MIS recruiting.

There has been much consolidation with corresponding reductions in the MIS work force at Campeau Corp., the Canadian real estate and retail conglomerate that recently acquired Allied Stores Corp. and Federated Department Stores, Inc.

"We just consolidated nine [business] divisions into one," says Glen Griffith, chief of the Sabre Group of Atlanta, the data processing organization of Federated and Allied. Griffith says he was able to manage a significant reduction in MIS positions without laying off anyone, although many workers quit rather than relocate to Atlanta.

Some analysts see new opportunities for MIS professionals in the consolidations. To pay the massive costs involved in the takeovers, the victors, like Campeau, must sell off some divisions. "The division, now out on its own, must develop its own MIS," notes Robert Zimmerman, retail industry chairman and partner at accounting and consulting firm Coopers & Lybrand in New York. Zimmerman also sees a lot of new retailing ventures starting up.

> SYSTEMS DEVELOPMENT in the retail environment will experience "an explosion in the next few years."
>
> JOHN CHAY
> NATIONAL RETAIL MERCHANTS ASSOCIATION

Slow growing

In the past, MIS careers in retailing have been constrained by the industry's relatively sluggish move to integrated systems. "Retailers have been very slow to adopt technology," says Harris Gordon, senior manager of the Touche Ross Boston Retail Unit, a consulting group that specializes in retail systems.

But retailers have begun to appreciate the gains that can be achieved through information systems, Gordon says. New technologies such as scanning and electronic shelf pricing, combined with growing use of electronic data systems in merchandising and marketing, will create a demand for systems professionals.

Gordon says he also expects eventually to see widespread use of expert systems to interpret and analyze the voluminous flow of data coming from point-of-sale terminals and in-store distributed systems.

At the core of retail MIS is the traditional IBM mainframe; MIS professionals are required to have the full range of Cobol, CICS and other IBM skills, Zimmerman says. Retailers use distributed systems, called in-store processors (ISP), to run point-of-sale terminals and track in-store inventory. At this level, no single vendor dominates.

While most of the recent hiring has been at the level of programmer and programmer/analyst, retail MIS also uses what is called a business systems analyst. This person acts as a consultant and provides the interface between MIS professionals and end users such as the merchandising/marketing and warehouse/inventory managers who use systems, Silver says.

Retail programmers generally earn between $33,000 and $37,000 annually, depending on experience. Experienced progammer/analysts will make a little more. Business systems analysts earn up to $50,000, acting, in effect, as project managers, Silver says.

The future of retail MIS looks bright in light of the new technologies coming into use. In particular, retailers need MIS professionals for real-time operations, communications and networking, distributed processing and remote data entry through the point of sale, Gordon says. Computer professionals with extensive relational database experience will increasingly be in demand as retailers use information systems to relate product movement to marketing.

Retail today presents both good news and bad news to MIS professionals, depending on their perspective. For the short term, the news generally is bad. "The number of jobs is shrinking," Chay says. But in the long run, new technology and a growing realization of its value are expected to make MIS in retailing a growing field and a more exciting one.

Radding is a Boston-based author specializing in business and technology.

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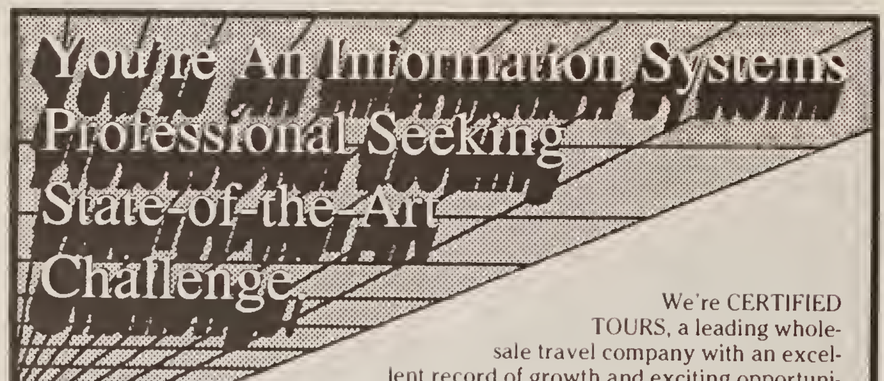
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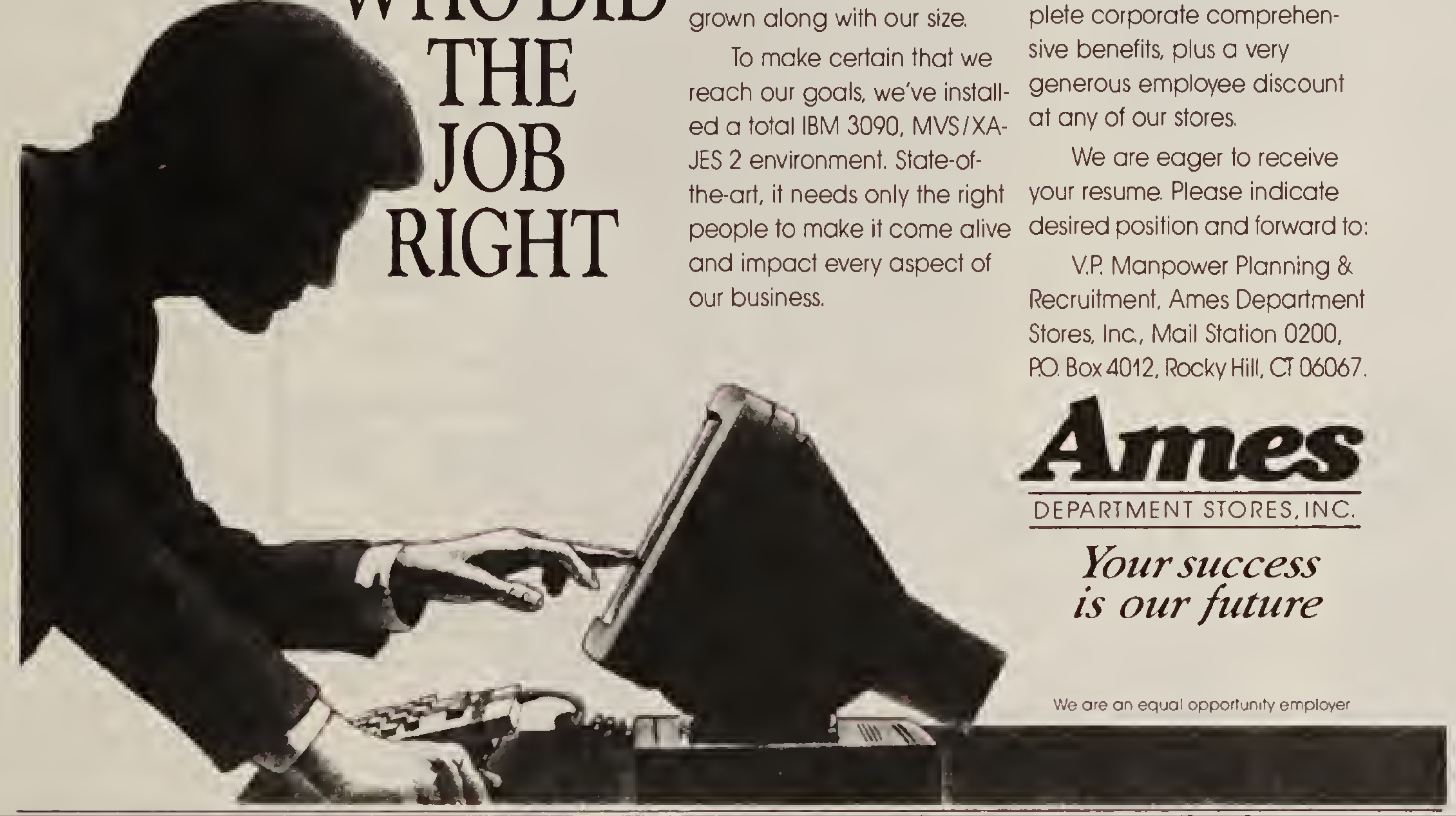

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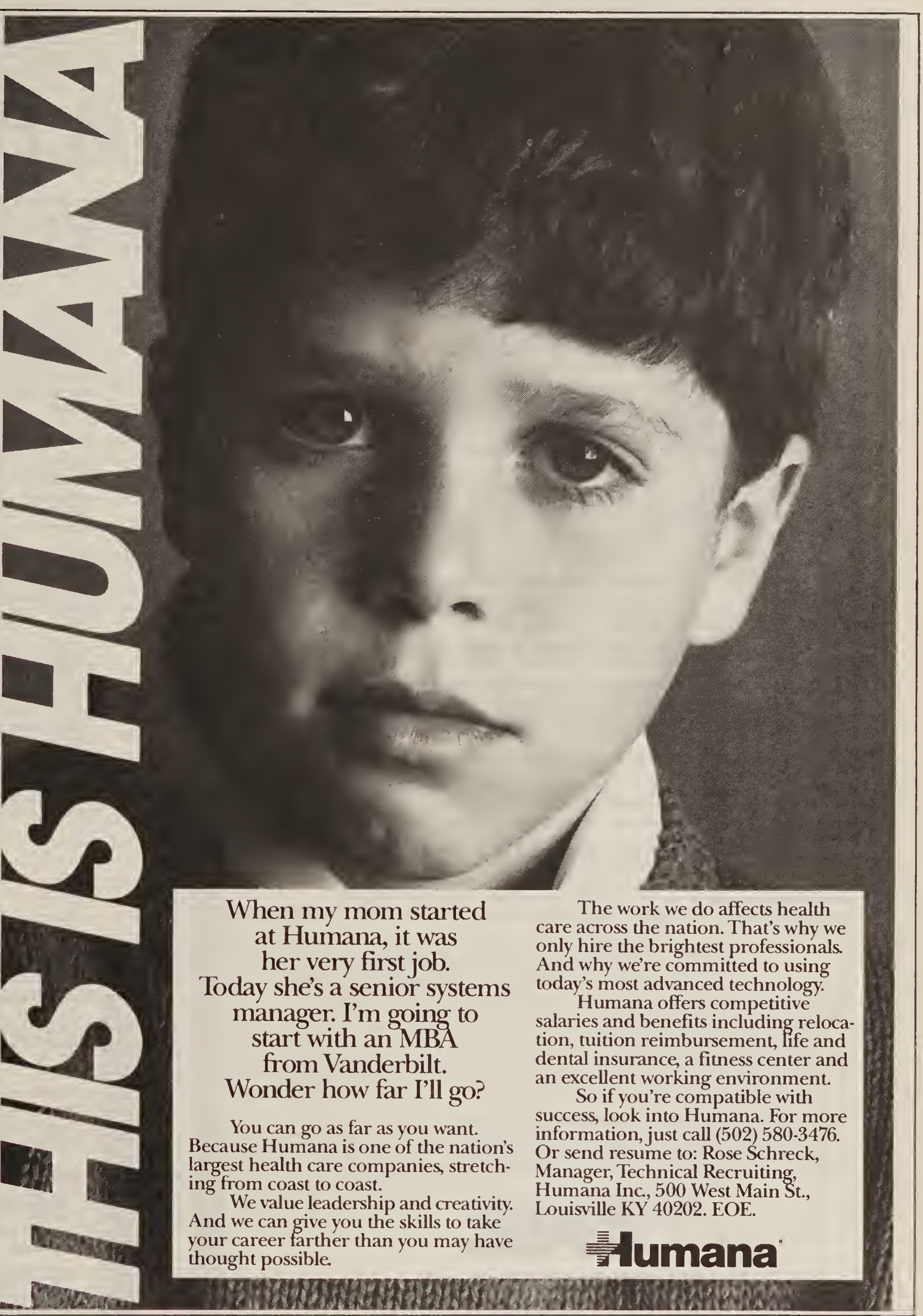

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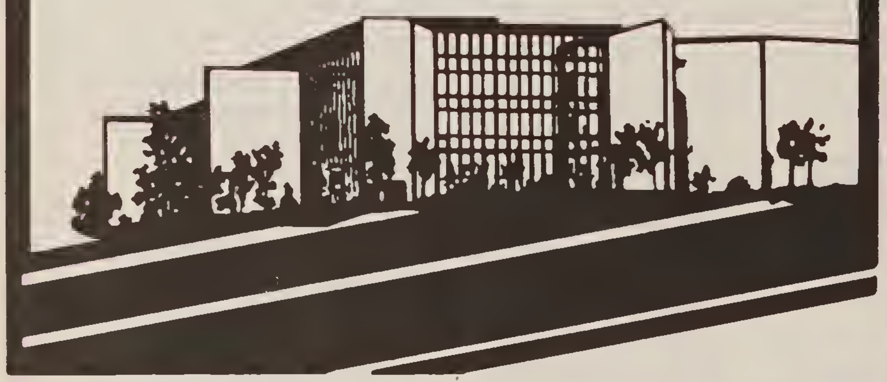

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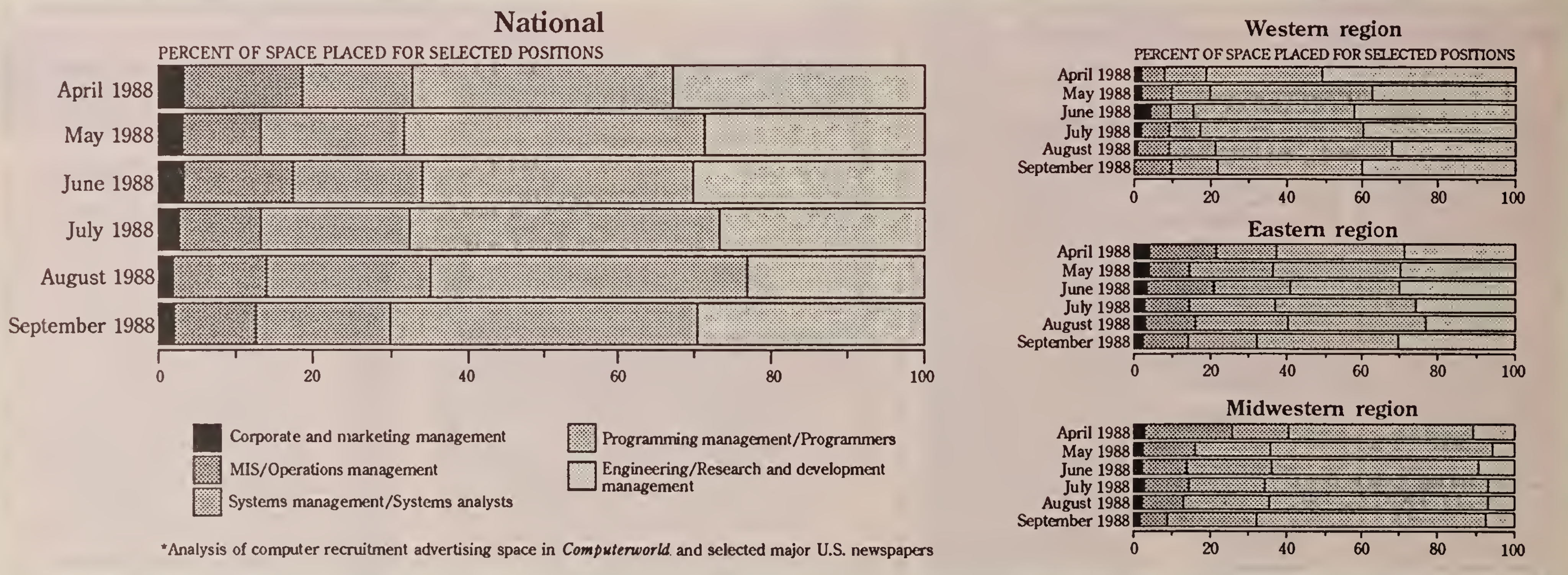
CAREER INDEX

Computer recruitment advertising activity*



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers

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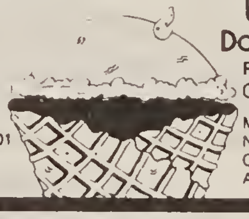

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— Alec Gindis
President
Spectrum Concepts, Inc.

Company president Alec Gindis was impressed with industry reaction after a news story announcing XCOM 6.2 appeared in *Computerworld.* So when Spectrum began implementing its marketing strategy for the new product, he considered *Computerworld* a key resource.

"Our goal was to generate sales leads from major organizations — Fortune 500 and Fortune 1000-type companies — that need to transfer files. We decided to use response card decks, and, based on the reaction we got to that product announcement, Computerworld's *was the card deck we thought of first.*

"And it's paid off; the results have been terrific. We've received hundreds of high-quality leads so far, and they're still coming in. In fact, Computerworld *Response Card Decks really opened doors to the 'heavy-hitter' accounts — major organizations that learned about us through the cards.*

"Now we've gotten to where we are recruiting additional account executives to follow up on the volume of these leads. Computerworld *Response Card Decks give us the best cost per lead of any medium. They also let us refine our marketing strategies through scientific 'split testing' — something other card decks don't always offer. We consider that a valuable bonus."*

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Protecting computer power

Understanding your problem is key to selecting an appropriate device

BY DAVID GABEL
SPECIAL TO CW

Brownouts, blackouts, power sags and power surges — these are problems that systems managers battle daily in order to maintain uninterrupted, trouble-free operation of their microcomputer systems. Protecting personal computers from power problems is becoming an increasingly critical task as the machines are entrusted with ever more crucial data and applications.

Fortunately, systems managers are not alone in this struggle; there are many products available to help them win the war against power failure.

There are many causes of power failure: lightning strikes, the failure of a power-line transformer, severing of lines by excavation equipment and interference from heating or air-conditioning motors, to name a few.

With so many potential power problems, it is not surprising that there is a plethora of products available to defeat them. Their prices range from $100 to thousands of dollars, depending on the problem and the size of the system.

The products include the following:

- **Surge suppressors.** At about $100, these devices dissipate the energy of a power spike or surge. They kill spikes and surges but cannot handle brownouts or blackouts, nor can they take care of short sags in the power level.
- **Line conditioners.** For a few hundred dollars, these large transformers handle spikes or power sags of less than 0.001 second in duration.
- **Standby uninterruptible power supply (UPS).** Costing several hundred dollars, a standby UPS is a solid-state system that senses a drop in the line power and switches itself onto the line. The UPS supplies power from a battery until the line voltage returns to normal or until the user shuts the computer system off.
- **On-line UPS.** For $1,000 and up, an on-line UPS continuously isolates the system from the power line. The power line charges a battery, and the battery then supplies power to the system.

The output of a UPS can be of two types: sine wave or square wave. Square waves are less expensive to generate but can pose problems.

With all these choices of power supply and protection devices, picking the right one is tough. The user has to know exactly the kind of problem he is facing.

Power protection

An order of magnitude separates prices of devices for dealing with various power problems

Problem	Solution	Average price
Power spikes and surges	Surge suppressor	$100
Power sags	Line conditioner	$300 to $500
Power outages	Standby UPS*	$300 to $1,000
Outages with sags and surges	On-line UPS	$1,000 and up

* Uninterruptible power supply

CW CHART

Navtec, Inc., a small manufacturer of high-tech marine hardware for sailboats in Littleton, Mass., chose an on-line UPS. "The power was unpredictable," engineering manager Michael Mulhern says. "We were averaging about once every 10 days for our network server to go down."

Assuming that the problem was power surges, the company bought a $100 surge suppressor. However, the system still went down. So Mulhern rented a power-line monitor. This device plugs into the power line between the wall socket and the equipment experiencing power problems.

The monitor measures and records the value of the power line and any deviations from the nominal level. Monitors are available from electronic equipment-rental shops. "We found we were getting dropouts," Mulhern says. Dropouts are decreases in line voltage from its normal value of 110V to 117V to about 60V.

Mulhern hired a consultant, who suggested an on-line UPS for several reasons: first, a surge suppressor would not take care of the dropouts; second, there was a need to handle blackouts; and third, the power line was noisy and had to be filtered.

Navtec installed the on-line UPS. "Now we average about one time every six months that the server goes down for unknown reasons," Mulhern says. He speculates that the cause might be a user on the network crashing the system, or someone kicking the plug out of the wall.

As Mulhern's case illustrates, it is important to determine the precise power problem; renting a power-line monitor usually is the best way to do this.

By choosing a less sophisticated device, users may be able to save a lot of money. It makes little sense to spend $1,000 or more for a UPS when a $100 surge suppressor will fit the bill.

Gabel is a free-lance writer and former data center manager based in Northport, N.Y.

The BoCoEx index on used computers

Closing prices report for the week ending Nov. 18, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	$600	$900	$400
XT Model 086	$1,200	$1,250	$900
XT Model 089	$1,300	$1,575	$1,050
AT Model 099	$2,050	$2,400	$1,700
AT Model 239	$2,375	$2,900	$1,800
AT Model 339	$2,450	$3,600	$2,425
PS/2 Model 30	$1,650	$1,700	$1,300
PS/2 Model 50	$2,400	$2,600	$1,900
Compaq Portable I	$650	$975	$650
Portable II	$1,700	$2,000	$1,650
Portable III	$2,500	$3,550	$2,500
Portable 286	$1,775	$2,400	$1,675
Plus	$1,100	$1,250	$800
Deskpro 20-MHz	$1,100	$1,500	$800
Deskpro 286	$2,400	$3,150	$1,800
Deskpro 386	$4,400	$5,100	$4,100
Apple Macintosh 512	$725	$950	$550
512E	$850	$1,025	$600
Plus	$1,125	$1,325	$950
Plus 20-MHz	$1,450	$1,650	$1,300
SE	$2,000	$1,950	$1,700
SE 20-MHz	$2,600	$2,675	$1,800
II	$3,300	$3,500	$3,275
Apple Laserwriter II-NT	$2,775	$3,000	$2,550
AT&T 3B1 UNIX	$1,300	$1,325	$1,050

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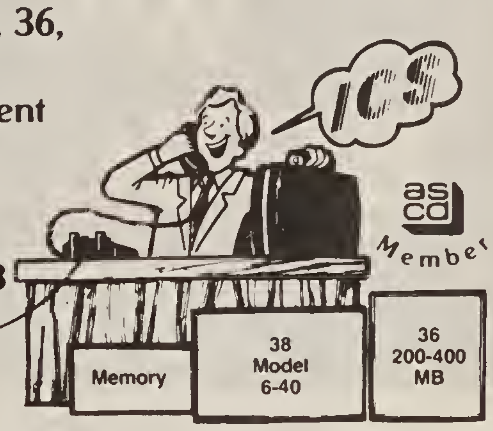

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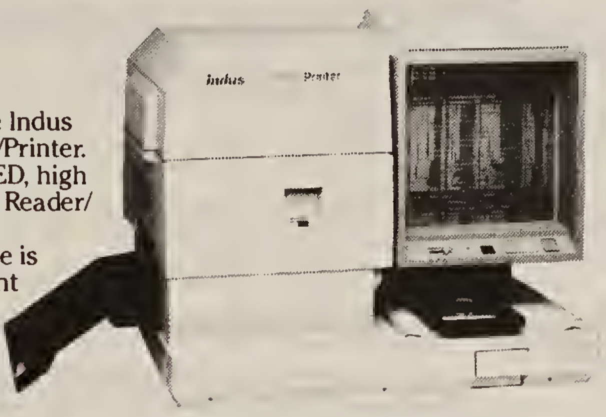

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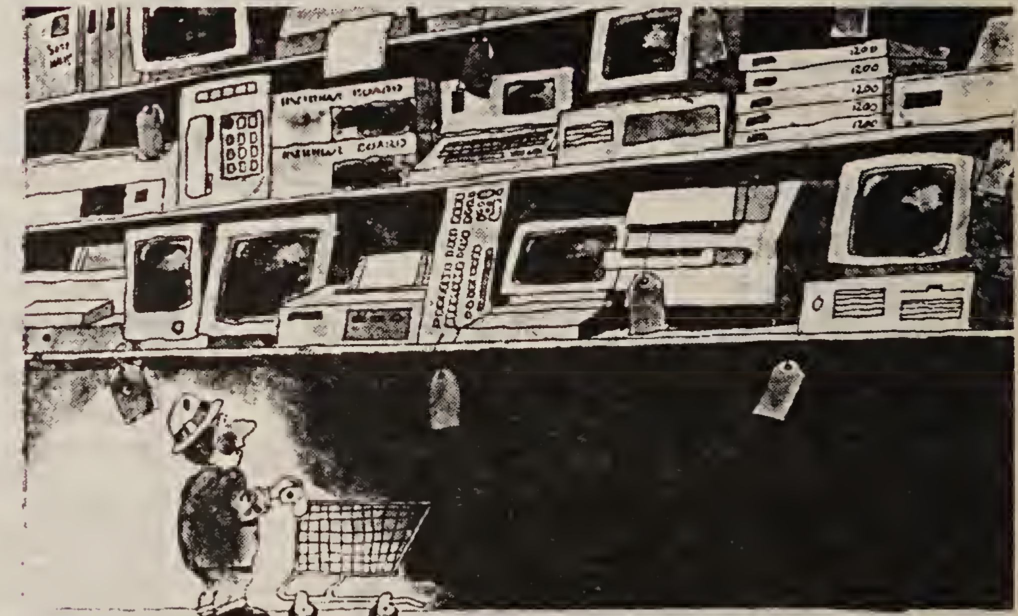

Upcoming Computerworld Spotlight Sections

Issue Date	Topic	Ad Closing Date
Dec. 5	LAN's	Nov. 18
Dec. 19	IBM-Compatible PCs/PS2 Market Products/Monitors	Dec. 2

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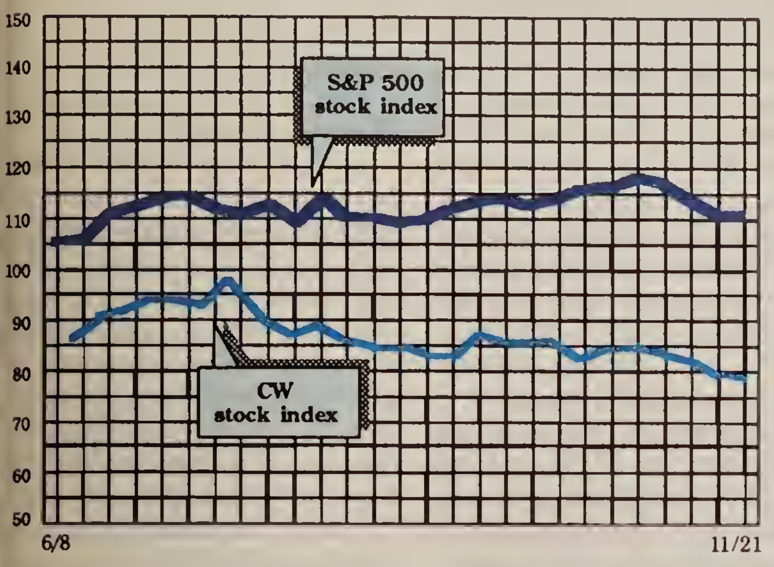

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Computer Systems	88.1	**88.1**
Software & DP Services	96.9	**96.4**
Semiconductors	51.6	**50.7**
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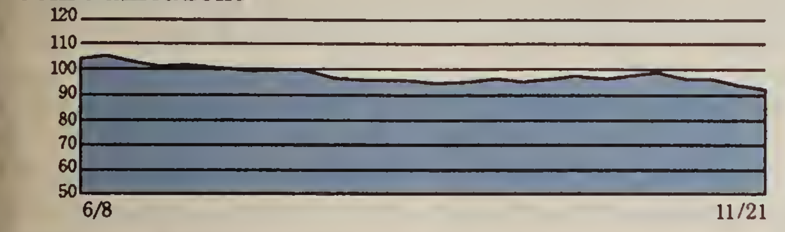
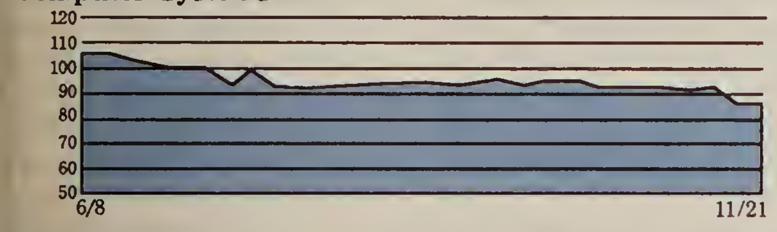
Leasing Companies	105.9	**101.5**
Composite Index	79.3	**78.2**
S&P 500 Index	110.9	**111.9**

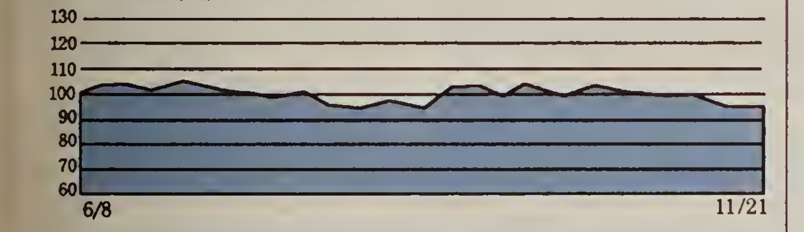
Communications



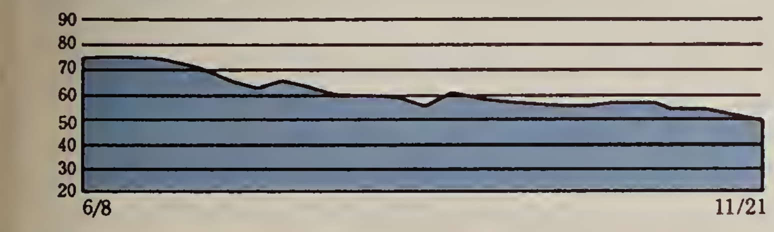
Computer Systems



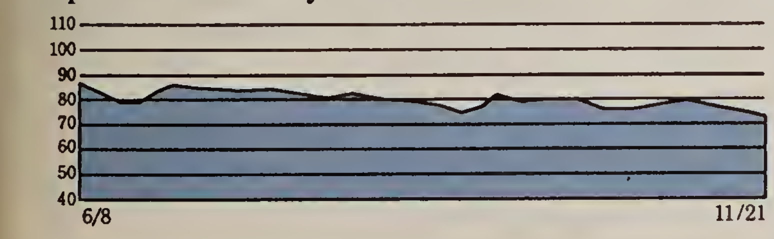
Software and DP Services



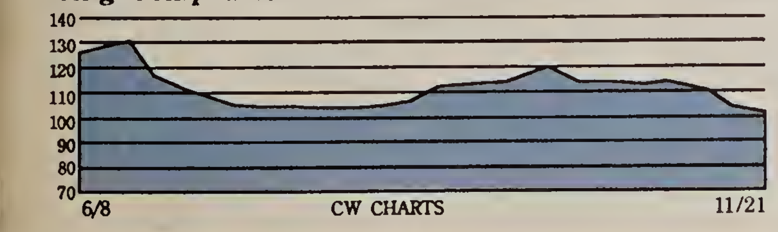
Semiconductors



Peripherals and Subsystems



Leasing Companies



Computerworld Stock Trading Summary

CLOSING PRICES MONDAY, NOV. 21, 1988

Communications and Network Services

EXCH		52-WEEK RANGE (1)		PRICE CLOSE NOV. 21 1988	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	97	80	92.25	0.4	0.4
Q	ANDREW CORP	19	11	17.25	0.8	4.5
Q	ARTEL COMM CORP	3	1	1.75	0.0	0.0
N	AT&T	30	24	28	0.4	1.4
Q	AVANT GARDE COMP INC	3	0	0.375	-0.1	-25.0
Q	AVANTEK INC	9	5	4.5	-0.1	-2.7
N	AYDIN CORP	26	18	21.25	0.0	0.0
N	8ELL ATLANTIC CORP	75	62	70.375	0.5	0.7
N	8ELLSOUTH CORP	44	35	39.25	0.0	0.0
Q	COMPRE55ION LA8S INC	5	3	3.25	-0.1	-3.7
O	COMPUTER NETWORK TECH	3	1	1.407	0.0	0.0
O	CONTEL CORP	39	27	37.25	0.4	1.0
Q	DATA 5WITCH CORP	10	4	5.375	0.1	2.4
Q	DIGITAL COMM A5SOC	38	20	19.875	-0.5	-2.5
Q	DYNATECH CORP	24	18	19.75	-0.8	-3.7
Q	FI8RONICS INTERNATIONAL INC	5	2	3.813	0.1	3.4
Q	GANDALF TECHNOLOGIE5	8	5	5.625	0.3	4.7
Q	GENERAL DATACOMM IND5	5	3	3.875	0.1	3.3
N	GTE CORP	45	34	43.25	0.5	1.2
Q	INFOTRON SYS CORP	14	5	10.5	-0.5	-4.5
N	ITT CORP	55	42	49.125	1.1	2.3
N	M A COM INC	11	8	9	0.0	0.0
Q	MCI COMMUNICATION5 CORP	24	9	20.5	-0.4	-1.8
Q	NETWORK EQUIPMENT TECH INC	23	13	14	-0.5	-3.4
Q	NETWORK SY5 CORP	12	7	9.125	-0.6	-6.4
N	NORTHERN TELECOM LTD	20	15	15.875	0.1	0.8
Q	NOVELL INC	32	17	27.5	-0.8	-2.7
N	NYNEX CORP	71	61	65.25	-0.3	-0.4
N	PACIFIC TELESI5 GROUP	32	25	29.75	0.3	0.8
N	PARADYNE CORP	6	4	5.25	0.0	0.0
A	PENRIL CORP	5	2	4	0.0	0.0
N	PLE55EY PLC	41	23	39.75	-0.6	-1.5
N	SCIENTIFIC ATLANTA INC	16	10	11	-0.5	-4.3
N	SOUTHWE5TERN 8ELL CORP	42	33	40.125	0.5	1.3
Q	3 COM CORP	24	16	17.375	-0.1	-0.7
N	U S WEST INC	59	47	55.875	0.3	0.4

Computer Systems

EXCH		52-WEEK RANGE (1)		PRICE CLOSE NOV. 21 1988	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ALLIANT COMPUTER 5Y5	9	3	4.5	-0.1	-2.7
Q	ALPHA MICROSY5TEM5	8	3	5.75	0.0	0.0
Q	ALTOS COMPUTER SY5	13	7	7.25	-0.3	-3.3
A	AMDAHL CORP	28	13	18	-0.1	-0.7
Q	APOLLO COMPUTER INC	17	7	7	-0.1	-1.8
Q	APPLE COMPUTER INC	48	30	36.625	-1.4	-3.6
N	8OLT 8ERANEK & NEWMAN	19	11	11.25	-0.5	-4.3
Q	8RITTON LEE INC	3	1	1.938	-0.1	-6.1
N	COMPAQ COMPUTER CORP	66	39	53	-1.0	-1.9
Q	COMPUTER AUTOMATION INC	14	3	4.75	2.0	72.7
A	COMPUTER CDNSOLE5 INC	9	3	6.75	-0.1	-1.8
Q	CONCUREENT COMP CORP	8	4	4.5	0.0	0.0
N	CONTROL DATA CORP	31	16	16.875	-0.4	-2.2
Q	CONVERGENT TECH	7	3	6.375	0.0	0.0
Q	CONVEX COMPUTER CORP	11	6	8.875	0.1	1.4
N	CRAY RE5H INC	89	53	53.25	-1.1	-2.1
Q	DAISY SY5 CORP	12	6	5.875	-0.6	-9.6
N	DATA GEN CORP	28	17	17.375	-0.3	-1.4
N	DATAPOINT CORP	6	4	4.125	-0.3	-5.7
Q	DELL COMPUTER CORP	13	8	10.125	-1.5	-12.9
N	DIGITAL EQUIP CORP	145	86	91.375	2.4	2.7
N	FLOATING POINT SY5 INC	5	3	2.625	-0.1	-4.5
N	HARRI5 CORP	33	22	26	0.3	1.0
N	HEWLETT PACKARD CO	66	44	47.25	1.4	3.0
N	HONEYWELL INC	77	51	60.125	0.0	0.0
N	I8M	130	104	115.625	0.1	0.1
Q	INFORMATION INTL INC	16	10	13	-0.5	-3.7
Q	IPL 5Y5 INC	5	1	4.375	0.0	0.0
N	MAI 8A5IC FOUR INC	21	9	8.875	-2.1	-8.0
Q	MASSACHUSETTE5 COMPUTER CO	7	4	0	0.0	0.0
N	MATSU5HITA ELEC INDL LTD	230	151	193	7.8	4.2
Q	MEGADATA CORP	4	1	1.5	-0.1	-7.7
Q	MENTOR GRAPHIC5 CORP	37	16	25.25	1.9	8.0
N	N8I INC	7	2	1.875	0.0	0.0
N	NCR CORP	70	52	51.75	-0.1	-0.2
N	PRIME COMPUTER INC	19	12	16	-1.0	-5.9
Q	PYRAMID TECHNOLOGY	16	5	15.375	0.3	1.7
Q	SILICON GRAPHICS CORP	25	14	16.125	-0.1	-0.8
Q	STRATU5 COMPUTER	32	16	22.25	-0.3	-1.1
Q	SUN MICRO5YSTEM INC	41	25	27.125	-0.4	-1.4
Q	5YM8OLICS INC	2	1	1.188	-0.1	-5.0
Q	5EQUENT COMPUTER 5YS INC	19	12	16.25	0.6	4.0
N	TANDEM COMPUTERS INC	30	12	15.875	0.5	3.3
N	TANDY CORP	49	28	41.125	-0.5	-1.2
N	ULTIMATE CDRP	22	9	9.125	-0.4	-3.9
N	UNISYS CORP	39	25	25.5	0.1	0.5
A	WANG LA8S INC	17	8	8.125	0.0	0.0

Software & DP Services

EXCH		52-WEEK RANGE (1)		PRICE CLOSE NOV. 21 1988	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ADVANCED COMP TECH	4	1	2.125	-0.2	-8.1
Q	AMERICAN MGMT SY5 INC	19	9	13.375	-0.3	-1.8
Q	AMERICAN SOFTWARE INC	16	7	15.25	1.3	8.9
N	ANACOMP INC	12	5	7.75	0.0	0.0
Q	ANALY5TS INTL CORP	10	6	10.125	0.3	2.5
Q	A5HTON TATE	31	15	22.75	-1.3	-5.2
Q	ASK COMPUTER SY5 INC	16	6	12.625	0.1	1.0
Q	AUTODE5K INC	31	16	24	0.8	3.2
N	AUTO DATA PROCE5SING	47	35	36.75	0.6	1.7
Q	BMC 5DFTWARE INC	11	8	9.375	-0.4	-3.8
Q	BDOLE & 8ABBAGE INC	10	7	9.5	-0.1	-1.3
N	8U5INE55LAND INC	15	7	12.125	-0.1	-1.0
N	COMPUTER A55OC INTL INC	33	22	27	-0.3	-0.9
Q	COMPUTER HORIZON5 CORP	12	7	8.625	0.3	3.0
N	COMPUTER SCIENCES CORP	56	38	44.125	-0.5	-1.1
Q	CORPORATE 5OFTWARE	15	6	9	-0.5	-5.3
N	COMPUTER TASK GROUP INC	17	9	13.125	-1.6	-11.0
Q	COGNOS INC	8	4	6.5	-0.1	-1.9
Q	COMSHARE INC	25	13	19.25	0.0	0.0
N	CULLINET SOFTWARE INC	9	4	4.875	-0.3	-4.9
Q	DUQUE5NE SYS INC	22	15	18.25	0.3	1.4
N	GENERAL MTR5 (CLS E)	45	30	40.75	1.4	3.5
Q	HOGAN 5Y5 INC	6	3	4.25	0.3	6.3
Q	INFDRMIX CDRP	26	7	6.75	0.0	0.0
Q	INTELLICORP INC	4	2	3.375	0.1	3.8
Q	KEANE INC	16	6	15.25	0.5	3.4
Q	LOTUS DEV CORP	34	15	17.125	-0.1	-0.7
Q	MANAGEMENT 5CI AMER	14	6	6.75	-0.1	-1.8
Q	MICRO PRO INTL CORP	4	2	2.313	0.1	2.8
Q	MICRDSOFT CORP	71	40	46	-0.3	-0.5
Q	MORINO A55OCIATE5 INC	20	10	16	0.3	1.6
Q	NATIONAL DATA CORP	32	19	19.5	-0.4	-1.9
Q	ON LINE 5OFTWARE INTL INC	14	4	5.75	-0.1	-2.1
Q	ORACLE SY5 CORP	22	10	16.5	0.3	1.5
N	PAN5OPHIC SY5 INC	19	13	13.125	-0.3	-1.9
Q	PHDENIX TECHNOLOGIES INC	18	13	13.25	-0.5	-3.6
Q	POLICY MGMT 5Y5 CORP	26	17	24	0.5	2.1
Q	PROGRAMMING & SY5 INC	16	7	15.5	0.5	3.3
Q	RA88IT 5OFTWARE INC	3	2	2.75	-0.3	-8.3
Q	RELATIONAL TECHNOLOGY INC	21	12	12.25	0.1	1.0
Q	REYNOLDS & REYNOLD5 CO	24	14	21	1.4	7.0
Q	SEI CORP	22	12	17.5	0.4	2.2
Q	5HARED MED 5Y5 CORP	27	14	16	-0.5	-3.0
Q	5AGE SOFTWARE INC	8	5	6.75	0.3	3.8
Q	5OFTWARE PU8G CORP	27	6	20.25	-0.1	-0.6
A	5TERLING 5OFTWARE INC	9	6	5.75	-0.6	-9.8
Q	5UNGARD DATA 5Y5 INC	20	10	15.25	0.3	1.7
Q	SYSTEMATICS INC	34	20	26.5	0.6	2.4
N	SYS. SOFT INC	24	8	21.75	-1.3	-5.4
Q	VM SOFTWARE INC	18	7	14.75	-0.8	-4.8

Semiconductors

EXCH		52-WEEK RANGE (1)		PRICE CLOSE NOV. 21 1988	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
N	ADV MICRO DEVICE5 INC	17	7	7.625	0.3	3.4
N	ANALOG DEVICE5 INC	16	8	10.375	0.4	3.8
Q	ANALOGIC CORP	8	5	7.25	0.1	1.8
Q	CHIPS & TECHNOLOGIE5 INC	21	8	11.5	-0.3	-2.1
Q	INTEL CORP	37	19	19.75	-3.0	-13.2
Q	LSI LOGIC CORP	14	7	8.25	-0.5	-5.7
Q	MICRON TECHNOLOGY INC	26	7	15.625	-1.3	-7.4
N	MOTOROLA INC	55	36	36.875	0.8	2.1
N	NATL SEMICONDUCTOR	15	8	8.375	0.1	1.5
N	TEXAS INSTRS INC	60	35	34.875	-0.6	-1.8
A	WESTERN DIGITAL CORP	18	11	11.75	0.0	0.0

Peripherals

EXCH		52-WEEK RANGE (1)		PRICE CLOSE NOV. 21 1988	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	ALLOY COMP	7	2	3	0.0	0.0
N	AM INTL INC	6	3	4.75	-0.1	-2.6
Q	AST RESH INC	17	6	7.5	-0.5	-6.3
Q	AUTO TROL TECH CORP	6	3	4.875	0.0	0.0
Q	8ANCTEC INC	12	5	9.25	0.0	0.0
Q	CIPHER DATA PROD5 INC	10	5	8.5	0.0	0.0
A	COGNITRONICS CORP	4	2	2.125	-0.1	-5.6
Q	CONNOR PERIPHERAL5	10	7	7.125	-0.3	-3.4
A	DATAPRODUCT5 CORP	13	7	10.75	0.0	0.0
A	DATARAM CORP	9	5	7.375	0.0	0.0
N	EASTMAN KDDAK CO	53	39	45.625	1.9	4.3
Q	E M C CORP MASS	19	4	4.5	0.0	0.0
Q	EMULEX CORP	11	4	9.875	0.3	2.6
Q	EVANS & SUTHERLAND	25	13	14.75	-0.3	-1.7
Q	ICOT CORP	5	2	2.5	0.0	0.0
Q	INTERLEAF INC	21	6	7	0.0	0.0
Q	IOMEGA CORP	5	1	3.25	0.0	0.0
Q	LEE DATA CORP	4	3	2.75	-0.1	-4.3
Q	MASSTOR 5Y5 CORP	3	1	2.063	-0.1	-2.9
Q	MAXTOR CORP	16	6	7.125	0.0	0.0
Q	MICROPOLIS CORP	30	6	6.5	-0.1	-1.9
Q	MINISCRI8E CORP	14	5	7	-0.3	-3.4
N	MINNE5OTA MNG & MFG CO	68	55	59	-0.4	-0.6
A	MSI DATA CORP	24	9	22.875	0.0	0.0
Q	PERSONAL COMPUTER PRODUCTS INC	7	4	5.063	0.0	0.0
Q	PRIAM CORP	3	1	1.125	-0.1	-10.0
Q	PRINTRONIX INC	11	7	8.5	0.3	3.0
N	QM5 INC	15	6	6.5	-0.1	-1.9
Q	QUANTUM CORP	14	9	12	-1.5	-11.1
N	RECOGNITION EQUIP INC	12	6	9.75	0.3	2.6
Q	REXON INC	9	4	6.625	0.0	0.0
Q	SEAGATE TECHNOLOGY	23	7	6.625	-0.3	-3.6
N	STORAGE TECH CORP	4	1	1.5	0.0	0.0
Q	TANDON CORP	3	1	1.438	0.1	4.6
A	TEC INC	6	3	2.75	0.1	4.8
N	TEKTRONIX INC	30	20	19.875	0.0	0.0
Q	TELEVIDEO 5YS INC	2	1	0.5	-0.1	-20.0
N	XEROX CORP	63	50	54.75	0.1	0.2

Leasing Companies

EXCH		52-WEEK RANGE (1)		PRICE CLOSE NOV. 21 1988	PRICE WEEK NET CHNGE	PRICE WEEK PCT CHNGE
Q	AMPLICON INC	18	7	16.25	-0.1	-0.8
N	CAPITAL ASSOCIATE5 INTERNATIONAL INC	7	4	5.5	-0.4	-6.4
N	COMDISCO INC	25	15	20.25	0.0	0.0
Q	CONTINENTAL INFO 5Y5	9	2	2.375	-0.6	-20.8
Q	LDI CORPORATION	14	9	13.25	0.3	1.9
Q	PHOENIX AMERN INC	4	2	3.25	0.3	8.3
Q	SELECTERM INC	6	3	4.5	-0.4	-7.7

EXCH:N = NEW YORK;A = AMERICAN;Q = NATIONAL

Fowled up

There's been no thanksgiving at Intel and other tech firms of late

While the nation prepared to give thanks last week, unforgiving Wall Street investors said no thanks to Intel Corp. and most other high-technology stocks.

Intel chose to announce its grim fourth-quarter forecast of flat earnings after the market closed Friday, Nov. 18; that may have been a mistake. When the opening bell rang Monday, the great sell-off was on. More than 13 million Intel shares changed hands, a 1988 record volume for major over-the-counter stocks, as Intel's price plunged 3⅜ points to 19¾. But the chip maker regained ⅜ of a point to 20⅛ Tuesday as it remained the market's most active stock, with volume of 4.8 million shares traded.

Other hard-hit chip vendors were Micron Technology, Inc., down 1¼ points in two days to 16⅜, and Cypress Semiconductor Corp., down ⅝ of a point to a new yearly low of 7¾.

MAI Basic Four, Inc.'s stock has dropped steadily since its hostile bid for Prime Computer, Inc.; it plummeted 1⅞ points Monday to a new low of 10¾. Prime also continued to drop, falling ½ of a point to 16, well below MAI's bid price of 20.

CLINTON WILDER

Pact may boost city nets to 45M

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Metropolitan-area networks supporting 45M bit/sec. could be closer than users think if a joint venture between AT&T Network Systems and an Australian network equipment vendor bears fruit.

The AT&T equipment manufacturing subsidiary and QPSX Communications Ltd. announced last week an agreement in principle under which AT&T Network Systems will obtain license to manufacture Queued Packet and Synchronous Exchange Metropolitan Area Network (QPSX MAN).

The switch is said to allow local carriers to provide 45M bit/sec. networking between customers' premises, breaking the long-standing 1.5M bit/sec. T1 barrier for switched networking.

Under the agreement, QPSX will market the product through QPSX Communications, Inc., a newly formed U.S. subsidiary in New Jersey, and AT&T Network Systems will provide the volume manufacturing for the U.S. market. The AT&T subsidiary will also distribute, install, service and support the product as part of the line of networking equipment it sells to regional Bell holding companies.

The first U.S. QPSX customer is Bell Atlantic Corp., which plans to test QPSX in a site trial with an undisclosed Philadelphia customer early next year, according to company spokesman Larry Plumb. If all goes well, the service will extend to other metropolitan areas within Bell Atlantic's region by the early 1990s.

Meeting speed demand

Southwestern Bell Corp. is currently evaluating QPSX as a way to provide customers with the higher speeds they are demanding, for LAN-to-LAN bridging and anything else that requires high throughput, such as electronic data interchange links between manufacturer and supplier, according to James Graham, a technology planning manager at Southwestern.

QPSX MAN is based on an early version of the IEEE 802.6 standard, which defines a metropolitan-area network that can support voice, data and video at speeds of 45M bit/sec. AT&T Network Systems will manufacture a QPSX product that adheres to the mature standard, which should be finalized early next year, said John Farrell, president of QPSX Communications, Inc. Volume delivery should start in 1991, he added.

Southwestern Bell is counting on vendors like QPSX to bring out 802.6-compliant switches, Graham said. Having standardized interfaces for customer locations is a prerequisite for the holding company to provide the high-speed data network as a switched offering, he added.

QPSX plans to migrate to the ANSI T1.S1 Committee's broadband Integrated Services Digital Network (ISDN) when it is finalized sometime in the early 1990s, Graham said.

At the conference, AT&T Network Systems also announced a new version of its Datakit, said to support data networking services to a local carrier's central office [CW, Nov. 21]. It also announced an agreement with Wang Laboratories, Inc. under which Wang will develop ISDN Basic and Primary Rate Interfaces that will allow the Wang Integrated Image System to access ISDN services via AT&T's 5ESS switch.

Anybody out there?

Electronic mail directory provides Eastman Kodak users with wide access and address search capabilities

- Over 80,000 Kodak personnel on-line
- Kodak-written directory software (name, mail code, department and so on)
- Accessible to IBM Profs, IP Sharp Associates Mailbox, DEC All-In-1
- Profs, All-In-1, Mailbox and KMX Voice Mail addresses
- Ability to create a message from the directory
- Ability to move an address to a nickname list

SOURCE: EASTMAN KODAK CO.
CW CHART

Kodak

FROM PAGE 1

"We started with a general vision that we'd like to message anyone in the company, from any terminal, to any destination, at any time," Brown said.

Those requirements break down into a more specific set of benefits: reliable 24-hour worldwide communications; access to all Kodak personnel and subsidiaries (Verbatim Corp. and Atex, Inc.); two-way access to anyone, anywhere, electronically; and the ability to quickly move acquisitions, such as Sterling Drug, Inc., on-line.

Forced to hazard an internal terrain mined with a mix of mail packages and multivendor systems, Kodak nonetheless has zoomed ahead with a solid messaging network, which enables it to fulfill its primary objective. Its success has enticed 30% of Kodak's 130,000 worldwide employees to access some kind of mail system.

What is unusual is the way Kodak has stitched together a quilt of systems encompassing voice, E-mail and file transfer, along with telex and cablegram. Even more amazing than 24-hour-a-day, seven-day-a-week worldwide service is the inherent security built into the system. Technically, messages never leave Kodak facilities, unless they are sent out to a public mailbox. Security devices such as encryption, user identification and passwords are in place.

These features aside, what really caught the attention of attendees at the recent Electronic Mail Association (EMA) Conference is that Kodak has pushed even further by devising a single, unified directory that not only lists users of voice and E-mail systems but also includes phone numbers for those not located on any messaging system. About 80,000 employees are listed in the directory.

"One of the reasons that Profs use has spread so far and wide within the company is that on the main menu, all you need at Kodak is a person's name," Brown claimed. Users do not have to know the messaging system or location of the addressee. They do not have to type in a string of commands or call up an unfamiliar menu — all of which are proven deterrents to E-mail use.

Single directory

Many of the users interested in Kodak's directory are waiting for CCITT's X.500 directory, which provides for a single, albeit distributed, directory. Initial release of commercial X.500 products is at least six months away. IBM has told Kodak that a full-function, distributed Professional Office System (Profs) directory is two years away.

The centralized directory is supplemented by two homegrown solutions (see charts). The first is Unique External Messaging. Available to Kodak's 30,000 time-sharing users, it provides access to 108 Kodak message centers worldwide at one tenth the cost of telex.

The second is KMX Voice Mail. Developed by Kodak initially to provide field personnel with communications, it currently supports 26,000 users worldwide sending 75,000 messages per day. It was recently sold to Taigon Corp.

Seeking to further extend messaging capabilities, Kodak today is moving to simplify bridging between unlike mail systems via CCITT X.400-based gateways, Brown said. The road to success has contained its share of pitfalls. A fairly decentralized approach to information management has fostered a mix of systems. This mix, combined with 100 worldwide locations and messaging needs that ranged from voice and data to paper and electronic — both inter- and intracompany — presented a formidable challenge.

Without force

Kodak decided early on not to force any messaging system, Anderson said. "We attempt to provide infrastructure, architecture and standards."

Beyond those guidelines, the various departments and subsidiaries are free to choose their own messaging agent, but they must pick up support duties — with one significant exception.

Anderson said a staff of 12 at Corporate Information Systems provides E-mail support to a massive Profs system, which serves 45,000 users sending an average of 180,000 messages per day. His group has provided all Profs users, regardless of the system they are on, with a standardized inital message screen.

"Profs is rich but awkward to use. It's not very user-friendly," Anderson said. Along with Brown, he said he believes that the standardized screen is partially responsible for the widespread use of Profs.

With 30% of the work force on the system, Anderson estimates that as many as 80% of Kodak's employees could find some benefit from electronic messaging. Efforts to link up with outside suppliers and research networks could encourage many of the uninitiated to jump. In the meantime, the two men note their work is far from over. "I can tell you, no one wants my job!" Anderson said.

Bridges yet to cross

When Gerry Brown surveys the road map of bridges crisscrossing messaging systems at Kodak, it is unlikely he will allow himself the luxury of a satisfied smile.

Those bridges, useful as they may be, can only bring to mind an even longer list of links yet to be implemented. The painstaking task of bridge-building is one the senior systems analyst has termed "tedious and self-defeating."

Despite Kodak's claim to fame, it does not provide electronic image transfer. That is because the technology has not yet been perfected, said Lewis Anderson, supervisor of Kodak's Computing & Telecommunication Services.

With that in mind, Brown and his colleagues in Kodak's electronic mail support group are counting on the CCITT X.400 messaging standard to relieve them of this expensive and time-consuming drudgery. It is also expected to provide a standardized way to electronically send and receive images.

Kodak is involved in a number of systems connecting it to outside business projects. The first one, already under way, involves using IBM's Information Network (IIN) value-added network as a gateway to non-Kodak suppliers. The first of its two components involves bridging between roughly 100 users of IBM Profs at Kodak to Profs users in IBM's marketing group.

The second part, scheduled to start next month, consists of a test of IBM's Expedite Mail, which requires a mailbox on IIN. The PC/Expedite version links small suppliers that do not have Profs to large trading partners that do.

Key benefits to Kodak include moving these suppliers from paper to E-mail at no cost to the company, because the mailboxes are rented by the suppliers. Also, "this program doesn't consume any company resources, and since we don't have to provide a Profs ID, there's no security issue," Brown said.

The second pilot targets links to Transmission Control Protocol/Internet Protocol (TCP/IP)-based networks and is slated to kick off in the first quarter.

The plan is to try to connect DEC-based mail with Kodak's TCP/IP users. Kodak plans to review products from a number of suppliers, including an X.400 message router on a Sun Microsystems, Inc. Sun-3/60 system and a Simple Mail Transfer Protocol X.400 gateway to Kodak's TCP/IP-based messaging community. Evaluation criteria include the overhead consumed, the functionality offered and the level of interoperability.

PATRICIA KEEFE

Crimson ties questioned in virus case

BY JAMES DALY
CW STAFF

CAMBRIDGE, Mass. — A Harvard University assistant professor, systems programmer and graduate student have been ordered to testify this week before a federal grand jury investigating the spread of a computer virus that ground the Internet computer network to a near-halt earlier this month.

Assistant Professor of Computer Science Mark Friedell, computer programmer Andrew Sudduth and computer science graduate student Paul Graham are scheduled to appear in a Syracuse, N.Y., court Wednesday to explain their connection to Robert T. Morris Jr., a Cornell University graduate student and Harvard alumnus suspected of creating the virus that struck 6,000 computers nationwide.

As Federal Bureau of Investigation officers served the subpoenas Monday, other federal officers searched Harvard's Division of Applied Sciences for computer accounts that may show what role that facility played in the virus' spread, a Department of Justice official said.

The grand jury will reportedly investigate telephone conversations among Sudduth, Graham and Morris that began shortly after the virus began to spread.

Sudduth, a senior systems programmer at Harvard's Aiken Laboratory, where Morris worked for his last two years as an undergraduate, has stated that Morris phoned him shortly after the virus began. Sudduth said Morris asked him to sound the alarm about the virus and disseminate a message explaining how to inoculate computers against it. According to Sudduth, Morris said he was unable to do so because the virus had inactivated his system at Cornell.

Prime cries foul at MAI tactics

BY NELL MARGOLIS
CW STAFF

NATICK, Mass. — Prime Computer, Inc. struck back at hostile would-be acquisitor MAI Basic Four, Inc. last week with a legal action that raises the issues of bad faith and questionable acts on the part of MAI's principals.

Prime's action was filed in the form of a counterclaim to MAI's earlier suit in federal court in Massachusetts seeking clarification of certain state antitakeover laws. Prime's counterclaim asks the court to compel the Tustin, Calif.-based company to fully disclose a raft of details concerning its unsolicited $20-per-share bid for Prime's stock.

"This does not at all mean that we are rendering a negative opinion about the offer," a Prime spokesman said. "We're merely asking for more information."

Prime alleged that MAI's tender offer materials were deficient in disclosing the nature of MAI's relationship with investment firm Drexel Burnham Lambert, Inc., which early on declared itself "highly confident" that it could fund up to $875 million of the MAI buy with junk bonds.

Prime also questioned the nature of the financing of the deal, which, if consummated, would leverage the combined firms to a highly vulnerable point, according to market analysts.

Digging up the past

Furthermore, Prime sought further information on "alleged violations of the federal securities laws by certain of [MAI's] principals in prior dealings involving other companies," according to a statement.

In 1986, William Weksel — who, with business partner and MAI chairman Bennett LeBow, owns 43% of MAI's stock — was charged with insider trading and overstatement of three years' worth of pretax income while serving as chief executive officer of Information Displays, Inc., a then-bankrupt Armonk, N.Y.-based computer-aided design firm. Weksel and a co-defendant subsequently settled the case without admitting culpability.

The Prime board is due to announce its decision by tomorrow and has urged stockholders to sit on the offer until then.

Meanwhile, reaction from Wall Street and the technology community continues to be predominantly — in many cases, profoundly — negative.

"Will Prime be better off as part of MAI? No way!" said Richard Shaffer, president of Technologic Partners, a computer industry consulting and research firm in New York. Shaffer dismissed the deal as "another example of the junk food Wall Street's been dishing out lately — nothing but empty calories."

Sparc Vendor Council to steer clear of Sun aegis

BY JULIE PITTA
CW STAFF

MOUNTAIN VIEW, Calif. — Several semiconductor makers have joined forces to promote Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc). The group hopes to blunt the notion that Sun controls the architecture it has promoted as an industry standard.

The Sparc Vendor Council includes Sparc licensees Texas Instruments, Inc., Fujitsu Ltd., LSI Logic Corp., Cypress Semiconductor Corp. and Bipolar Integrated Technology, Inc.

Cypress President and Chief Executive Officer T. J. Rodgers said the group's charter is to increase Sparc's acceptance in the market by placing distance between Sparc and Sun. Sparc is a reduced instruction set CPU architecture that Sun has licensed to both chip manufacturers and other computer vendors.

"What we're trying to do is take the control of Sparc to a neutral place," Rodgers explained. "Sun is a very successful company, and it's a competitor to some of our customers."

The council was formed with Sun's blessing. Chairman and CEO Scott McNealy attended the group's first meeting, held two weeks ago [CW, Nov. 14]. "Someone other than Sun needs to promote Sparc," he said.

A subcommittee of the council is meeting almost daily to determine what direction the council will take. Among the items it will consider is whether to establish a separate firm to license Sparc to computer vendors.

Other semiconductor manufacturers were reluctant to project what form the council will eventually take.

Standard war

FROM PAGE 1

Channel systems have begun to draw out third-party add-on products, in addition to its own internally developed products.

Three months of relentless banter regarding the Micro Channel's advantages was already muffled at Comdex/Fall '88 when IBM showed a variety of bus-mastering add-in cards in addition to diverse bus-mastering applications.

Bus-mastering allows processors other than the CPU to control the I/O bus. The technology will make possible intelligent subsystems and essentially eliminates the need for most AT add-in cards.

IBM demonstrated bus-mastering with reduced instruction set computing processors and a Token-Ring adapter, in addition to a small computer systems interface adapter.

An official from AST Research, Inc., an EISA member, questioned IBM's confidence in the Micro Channel technology, citing the fact that bus-mastering capabilities were not included with IBM's Token-Ring announcement at Comdex. But IBM officials stated at the firm's product demonstration that the company will merge bus-mastering adapters with the Token-Ring sometime in 1989.

An Intel Corp. product manager said the EISA technological specifications are still only 90% complete and that the first bus-mastering add-in cards will not be available for the alternative bus until late 1989. By then, IBM is expected to have on the market more than 100 add-in bus-mastering cards that fully exploit the Micro Channel.

Lucky numbers

International Data Corp., a Framingham, Mass.-based market research group, estimated that by the end of 1989, IBM will have sold almost five million MCA-based units.

Some research firms estimate the number to be much higher. MCA machines will represent 56% of PC purchases for 1989 in Fortune 1,000 accounts, according to Computer Intelligence Corp., a La Jolla, Calif.-based market research group.

These developments leave EISA in a precarious situation, according to John Dunkle, vice-president of the Aberdeen Group, a market research group headquartered in Boston. Dunkle predicted doom for the EISA bus.

Although some of the EISA group's members still talk of a united group, other members are reading the writing on the wall. Tandy Corp. is now shipping its MCA machines and is ramping up to meet customer back orders, according to a company spokesman. Tandy also appears to be putting some distance between itself and the EISA consortium.

"The way we see it, we're a head up on the EISA vendors because we are the first to make MCA shipments," the spokesman said. "The EISA vendors have to wait."

Can't say no

EISA supporters Phoenix Technologies Ltd. and Intel are stating that business, not the bus, is the issue. Intel's microcomputer general manager Paul Otellini emphasized that Intel is a supplier to, not an advocate for, EISA. Justifying the company's announced support of EISA, Otellini said, "We just don't like to say no to that many big guys at once."

Wyse Technology, an EISA cofounder that is now negotiating a cross-licensing agreement with IBM for an MCA patent utility, is speeding up its MCA product development. Last week, Wyse announced an agreement with Phoenix to license advanced read-only memory BIOS products for use in MCA-based systems. The companies also signed an agreement to work together on EISA-based designs, indicating their EISA plans are still in the preliminary stages.

The Intel official contended that the EISA bus will provide a larger board that will support more add-in functions than the Micro Channel.

But the trade-off, he acknowledged, is that a larger chassis would have to be used to box the EISA bus, an unsightly departure from the current trend toward providing users with more compact systems.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, except: (6) issues in February, May, August and October, (5) issues in January, March, April, June, July, September and November and (4) issues in December with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

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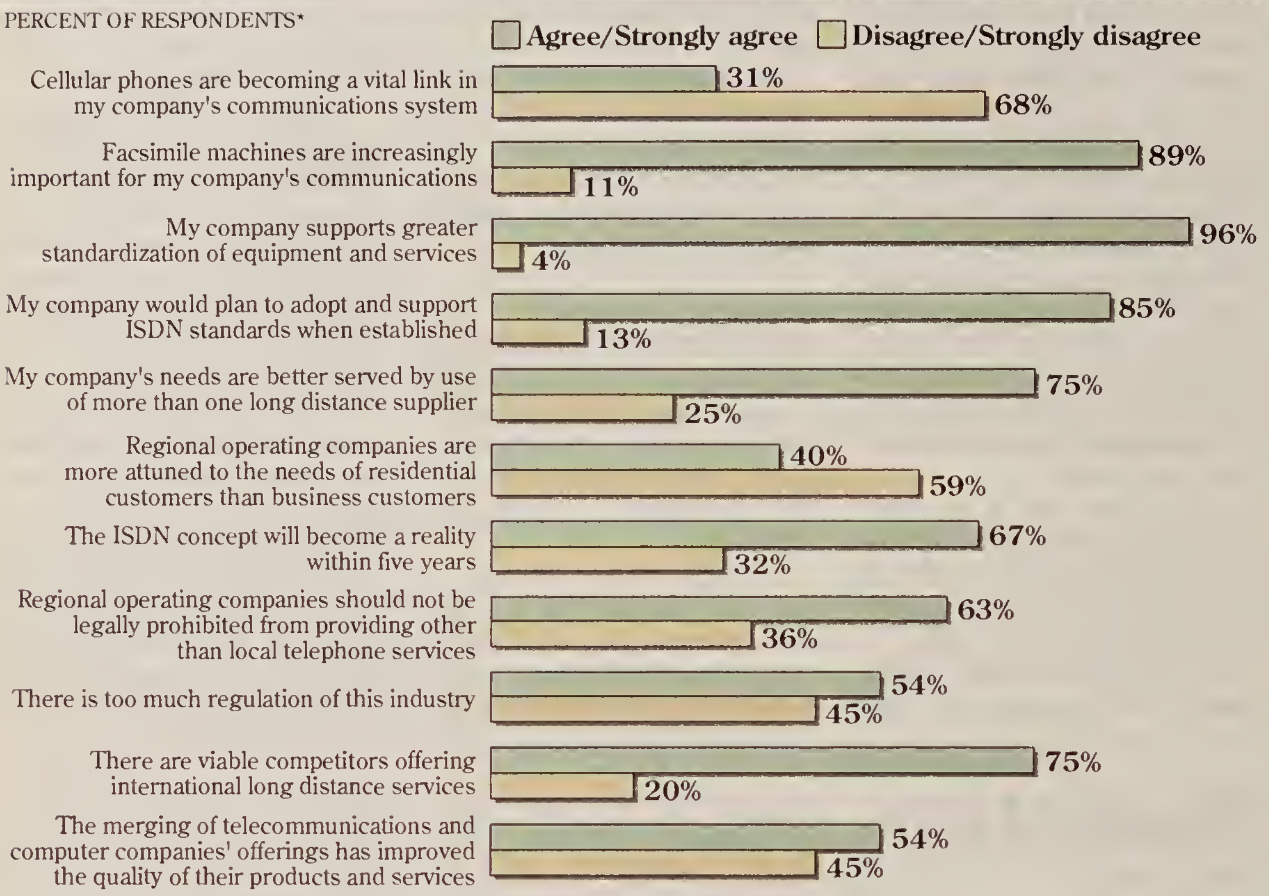
TRENDS

Telecom decision making

To what extent do you agree or disagree with each statement?



*Base of 364; whenever the percentages do not total 100%, the difference is attributable to nonresponse

Telecommunications is picking up the pulse of corporate competitiveness, and management's demands for flexible, cost-effective systems are keeping the industry alive.

An independent survey of International Communications Association (ICA) members commissioned by *The Wall Street Journal* takes a look at buying influences in the telecommunications market.

Out of 375 total respondents, 97% approve telecommunications spending in their companies. Their firms tally billings of more than $1 million annually in common carrier communications charges. The report, "Telecommunications: The Decision-Makers," tabulated results from the answers of only these 364 executives.

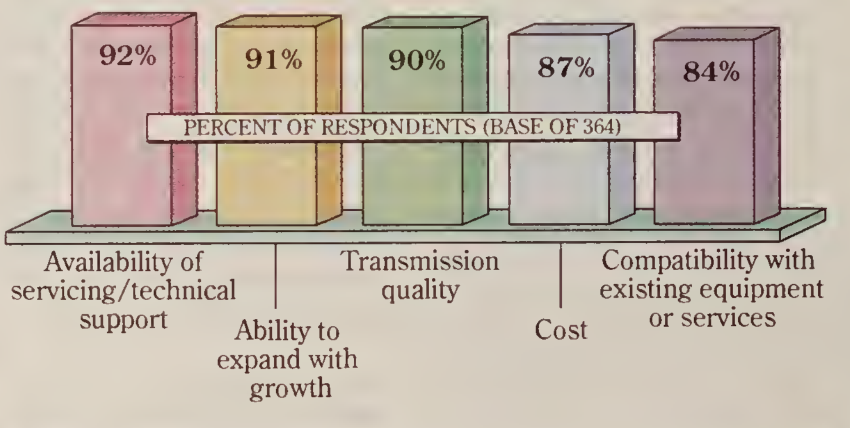
A paramount concern is standardization. Almost all agree that their firms favor increased standardization of equipment and services (96%) and will adopt Integrated Services Digital Network standards when they are established (85%).

Further highlighting their focus on standards, telecommunications executives place compatibility with existing products near the top of their purchase criteria. A majority also seek the ability to perform specific functions (78%), greater flexibility (71%) and customized pricing such as volume discounts (59%).

LAURA O'CONNELL

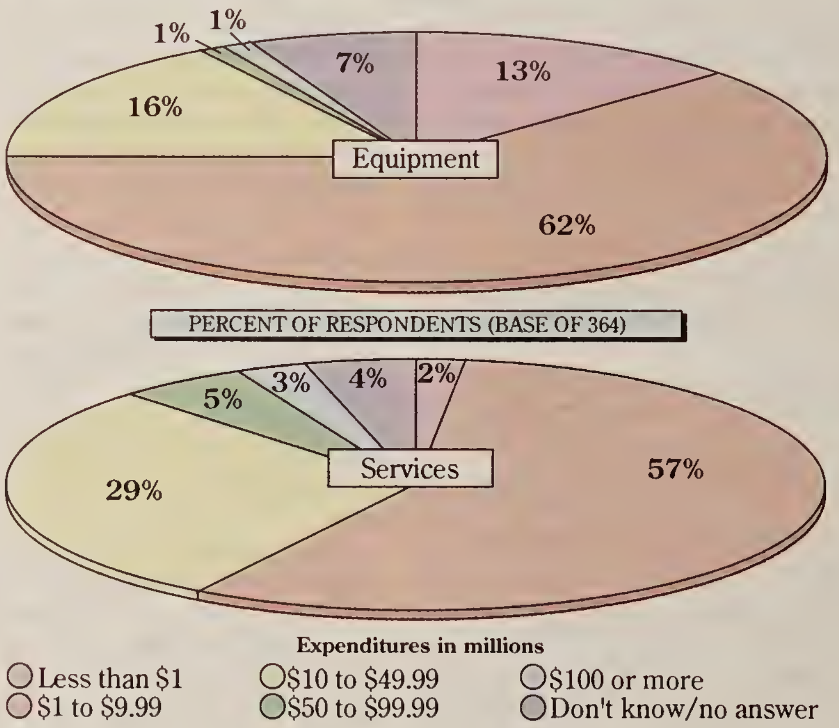
Top 5 acquisition criteria

"Which of the following criteria are most important to your company in telecom acquisition decisions?"



How much they spent in 1988

"What would you estimate your company's 1988 expenditures on telecom equipment and transmission services to be for all locations?"



SOURCE: *THE WALL STREET JOURNAL*

INSIDE LINES

Apples on the Vine. Banyan is set to introduce its first direct connect to Apple's Macintosh today. The Vines Mac Mail Gateway reportedly provides Mac-to-IBM PC and Mac-to-Mac electronic mail service over the Vines network. Mail is actually exchanged betwen Vines-based Network Mail and CE Software's Quickmail. The new gateway can send messages between Macs that are not located on the same physical network. Priced at $795 per server, the gateway requires no dedicated hardware and runs transparently on both the Vines server and the connected Macs.

Sounds like the Wobblies. Unionizing is not the game, but Unix International is the name the so-called Archer group is expected to adopt. In an announcement anticipated as early as this week, the group is also expected to name Don Herman, formerly of NCR, its president. According to some reports, the announcement has been on hold pending a meeting of the board of the X/Open Consortium, the international standards body, taking place on the same day in Dusseldorf, West Germany. The board is considering a proposal submitted by X/Open members involving "process adjustments" that would formalize X/Open's relationship with both the Open Software Foundation and the AT&T-backed Archer group — and would perhaps serve as a unifying force between the warring Unix groups.

Who'll pass the Token? Talk of an IBM licensing scheme for its 16M bit/sec. Token-Ring technology might produce some takers if IBM opts to build its own chips instead of using Texas Instruments' new token-ring chips, which are said to be set for announcement Dec. 6. Meanwhile, IBM's decision to provide the option of using either 4M or 16M bit/sec. on one Token-Ring card is expected to kill production of the 4M bit/sec.-only card in the near term.

What else would you expect at this point? Software vendors writing for Microsoft and IBM's OS/2 Presentation Manager are reporting that because the code still contains bugs, they are often writing software and debugging the operating system at the same time. These critters promise to hold up the delivery of Pman applications. Maybe that's just as well; it might give memory prices a chance to come down.

Why Next? Some hot PC software vendors, including Lotus, are now strongly considering development for the Next machine. The market for Next may not be huge, but writing for the machine gives vendors a leg up on AIX, IBM's version of Unix that will use the Next interface. According to our sources, going from Next to AIX with the Next interface is a simple recompile.

One day they'll get the story straight. IBM is reportedly about to release a white paper that will clarify its Micro Channel utility patent license "once and for all." When asked at Comdex/Fall '88 if IBM would issue a one- to two-year moratorium on the license, IBM President of Low-End Systems Bill Lowe said such a move would put him out of business. An IBM spokeswoman had said the white paper was "pure rumor." A story in Friday's *The Wall Street Journal* quoted an IBM spokesman on the paper's imminent release. One source, meanwhile, said an internal IBM document reportedly shows more than 200 companies licensed to use various aspects of Micro Channel technology. Included are 10 companies with sufficient cross-licensing to build MCA clones. The companies said to fit in this category are: DEC, NCR, Wyse, Novell, Dell, Everex, HP, AST Research, NEC and Zenith. No Compaq on that list, but there's plenty of talk about ongoing talks.

The question is whether the hacker had a sense of humor or was just a wishful thinker. When the Massachusetts town of Brookline this month printed its annual list of eligible voters, it became apparent that someone had tapped into the town's computer; the computer listed Michael Dukakis' occupation as "U.S. president." Of course, his wife Kitty was listed as "First Lady." But callers to the hot line (800-343-6474 or 508-435-6528) quickly quashed reports that someone named Robert Morris was listed as National Security Agency director. If you know better, call in and tip off News Editor Pete Bartolik.

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